

THE IRON AGE

Established 1855

New York, April 10, 1913

Vol. 91: No. 15

Plant of the Duff Mfg. Company, Pittsburgh

Steel Sash, Wire Partitions, Steel Bins, Central Oil Distribution and Telpherage Transportation for the Barrett Jack Factory

An interesting factory, in its construction features and in arrangements for expediting manufacture, has been built by the Duff Mfg. Company, Pittsburgh, for over 30 years a maker of lifting jacks. It represents an instance of the generous use of steel sash giving practically continuous glass walls, and of the adoption of wire mesh partitions for separating departments without obstructing vision or light to any extent. Among its other features are the provision for a comprehensive telpherage system for commanding all points of the works, the use of steel bins for raw and finished stock and a gravity circulating lubricating oil system.

The site containing the new plant is an ideal one, the works having direct sidings with the Pennsylvania Lines West and the Baltimore & Ohio Railroad, and it is located

have been embodied in the construction and equipment, and satisfactory results have been obtained in the matter of ventilation, light and general appearance.

The building crosswise has been divided into four bays, one of 30 ft., one of 35 ft. and two of 30 ft. The 35-ft. bay contains a monitor and is the crane bay. All of the bays are designed to provide for a telpherage system, and all roof trusses are so designed as to permit the operation of the crane or telpher hoist in connection therewith to cover practically every square foot of the building. While the installation has not been completed, the conveying system contemplates the use of a transfer bridge crane of 5 tons capacity, consisting mainly of I-beam—the telpher track—upon which runs a monorail telpher hoist, controlled from a cab in connection therewith. Under each



Main Shop of Duff Mfg. Company Looking from Heat Treating Department through Stock Room and Machine Shop toward Front End of Building

in one of the best manufacturing districts in Pittsburgh, being near the plants of the Pressed Steel Car Company, the Standard Sanitary Mfg. Company and the American Locomotive Company. The main building is 550 ft. long by 125 ft. wide and has an area of over 68,000 sq. ft. It is fireproof, being of steel, brick and concrete construction. Many notable features in design and construction

intermediate roof truss in the bays on both sides, or on 22 ft. centers, is secured a 15-in. I-beam, also the telpher track, which extends the length of the roof truss—30 ft. on one side and 60 ft. on the other. These beams project into the crane bay just sufficiently to meet the I-beam on the transfer bridge.

The main loads are taken up and down the crane bay

principally, so that the most frequent travel is in that bay, and as the monorail hoist travels along the I-beam of the transfer bridge, it covers practically every square foot of the main bay's area. To cover the side bays, the transfer bridge lines up with the I-beam on any desired intermediate roof truss, and when the I-beam on side bay roof truss and I-beam on transfer bridge are in exact alignment, as determined by a locking device, the monorail hoist may travel off the bridge, going into the side bay as far as the side walls if desired. While the monorail hoist is off the bridge, the latter is immovable and therefore is bound to await the return of the monorail hoist before the electrical contact is possible which permits the travel of the bridge itself. This arrangement is, of course, to prevent the monorail hoist's missing the bridge on the return to the main bay.

At the unloading end of the building, as well as at the loading end, it is provided that the monorail can travel out of the building, through large, high doors, and outside of the building the extension of the roof truss I-beams are carried on A-frames. Thus the monorail hoist may command a freight car on either the Pennsylvania or Baltimore & Ohio side tracks, or the wagon loading side of the warehouse, and deliver the load to practically any point in the building. Fully loaded trucks and sheet metal boxes for smaller parts are transported by the monorail hoist. Large machine tools, located in the crane bay, are, of course, served by this monorail hoist. Parts are carried to and from the machine shop, large steel bars are handled in and out of store and also the heat treating furnaces are served by the conveying system, which is designed to eliminate hand trucking as much as possible with a saving of time. This system provides for unlimited extension and additional transfer bridge and monorail hoists and comprehends taking in buildings likely to be erected. The removal of scrap is also to be facilitated by the telfer system.

There are no solid partitions in the building, heavy wire screening 10 ft. high being used exclusively to separate the stock rooms, tool room, tool supply, boiler room, etc. The use of this wire screening instead of solid partitions permits an unobstructed view of all departments from practically any point, and allows a maximum distribution of light and air. In the stock rooms and supply rooms, steel bins are used exclusively. The foreman's office is of metal and glass partition 10 ft. high and open at the top, located at a central point in the shop.

In the two stock departments—rough and finished—an extensive steel bin equipment has been installed. The bins are arranged conveniently in each department, but open floor space in both stock rooms has also been left for storing and handling incoming and outgoing stock and for the stocking of the larger parts. Each individual steel bin is designed to carry safely 2000 lb., and the bottom row of each stack of bins considerably in excess of that. Each bin is numbered and it is labeled with the shop drawing number of the part contained, together with the minimum quantity to be carried. A card is also placed on front of each bin for recording this information and

also the quantity of the parts put in and taken out. The steel bin equipment was furnished by the Berger Mfg. Company.

Centrally located in the shop is the tool supply room, with a man in charge of all small tools, jigs, fixtures, drills, high speed steels, etc. Tools and fixtures are checked in and checked out, so that they may be constantly kept track of. Drills, tools, etc., are standardized and shelved as to size, etc., and the supply kept normal. The jigs, for example, are inspected when returned so that they are constantly accurate and in good condition, a feature calculated to insure a high quality of product. In this room drills are reground, oil for hand oilers is supplied and tool steels of various kinds are stored for the requisition of the tool room, which adjoins the tool supply department.

A feature of the plant is a central oil distributing system, which covers all of the machine shop, and by which all machines are fed from a central point by gravity. The returned oil is passed through a series of strainers into a large tank, from which it is electrically pumped to the gravity tank and again passed through the entire system.

The plant is electrically driven throughout, both individual motor drive and group drive being used. All shafting runs on Hyatt roller bearings of the improved type.



Stock Room Showing Portion of the Steel Bin Equipment

Electric power is obtained from a central station, jointly with the Pittsburgh Screw & Bolt Company, the new plant of which (formerly the Riter-Conley Mfg. Company's plant) adjoins the Duff works. Power current is three-phase at 440 volts. In the superintendent's office, located in the general office building, a recording ammeter has been installed which records continuously the daily power load in the shop. This ammeter is wired direct from the main switchboard and not only shows the peak load but is useful as a check on foremen and men and their use of power. For instance, at the 12 o'clock noon hour, should any man or group of men begin to shut off their motors or machines ahead of the whistle, as frequently happens, the unwarranted loss of time is immediately recorded. The same sort of a record is available should the machines be started late after the noon hour. It is also possible to check up in what manner power has been used in night work, whether or not motors have been permitted to run idle. One of the important records is the manner in which motors are started, whether they are jammed on too suddenly or whether they are started carefully, as the chart graphically shows careless starting by a large jump in the amperage besides indicating the time it occurred. Other valuable data are obtained as well. For instance, recently

one phase winding burned out in the main transformer, which immediately stopped the recording of the power curve on the ammeter, the dial showing zero continually, although the shop was running. Investigation located the trouble in the transformer and the transformer failure might have caused damage to motors if allowed to continue. Broken belts or other interruptions come immediately to the attention of the manufacturing department in the office, which keeps them constantly in touch with actual operations.

For lighting purposes 110-volt alternating current is used. The monitor or main bay is artificially lighted with 250-watt tungsten lamps in Abolite reflectors, placed above the crane or approximately 23 ft. from floor. These lights are distributed along the entire length of the bay on 10-ft. centers and placed approximately 22 ft. 6 in. apart. The side bays are lighted by 60-watt and 100-watt tungsten lamps in Abolite reflectors, the bottom of the reflector being placed level with the bottom of the trusses, or 18 ft. from the floor. In each section of the side bays, that is, for each area 30 ft. x 22 ft. 6 in., three general lights are placed, two on one side of intermediate truss and one on the other side, then two and one in the next same area, and so on, this arrangement being carried out

the use of the watchman. The lights from the circuit are located in the center of the building and extend the entire length, and they are figured to give just sufficient light for the purpose in practically all parts of the shop. When starting his round, the watchman throws on the circuit of night lights, and when his round is completed he turns them off, thus using current only when needed. This circuit is entirely independent of the general lighting layout. The American District Telegraph watchman's service is used entirely, each station being a fire-alarm box as well as a watchman's station. The watchman's report registers at the main office of the telegraph company all night and he is, therefore, under constant supervision, and failure to register at any station within a specified time brings a representative at once to the building to investigate.

At the warehouse end of the building a large especially built testing machine is located for making actual working tests of lifting jacks. The machine operates on the main factory floor, although controlled from a large pit approximately 25 x 50 ft. and 15 ft. deep. Its capacity is 150 tons and permits an actual test of a jack of any capacity or type under field conditions.

Patterns not in actual use are to be stored in a mezzanine floor built over the testing department at the upper end of the warehouse. Each pattern is recorded and checked in and out of the foundry. The mezzanine storage space is to be fireproof, all steel work being heavily concreted and granolithic floor used.

The building is remarkably well lighted by daylight illumination by the use of Lupton steel side wall sash and Pond steel monitor sash. The side wall steel sash contains large double ventilators and the monitor sash are controlled by the Pond operating device, so that openings to the outside atmosphere are readily controlled and, if desired, practically the entire



Part of Machine Shop, Showing Lupton Side Wall Sash

the entire length of building, in both the 30-ft. bay on one side of the main bay and in the two 30-ft. bays on the other side.

Drop lights for machines, although provided for, have so far proved unnecessary, due to the large amount of daylight obtained by the steel side wall and monitor sash employed, as well as by a good distribution of general lighting, which suffices in early morning working hours and in winter months. A complete system of drop lighting, however, is available, as stated, if needed. In the side bays of the machine shop, the machines extend from the main bay toward the outside walls, located along the column line underneath the main roof trusses. On both sides of each main roof truss a drop light circuit is placed 3 ft. each way from the truss, the circuit each side of the truss containing boxes for three drops, making a total of six drops available in each case and affording ample drop light capacity for the double line of machinery located at that point.

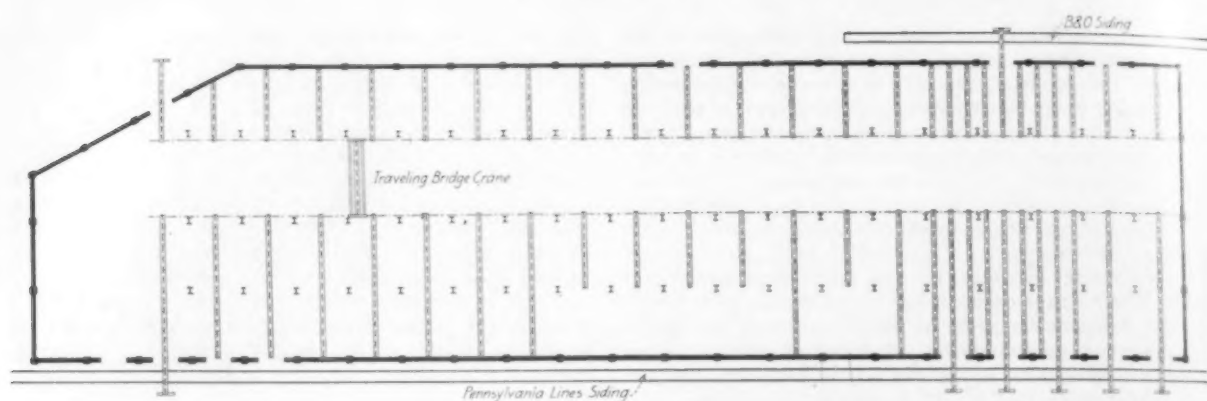
One of the features of the electrical installation, not usual in manufacturing plants, is a special circuit of lights for the night watchman. This night circuit is controlled at the upper or warehouse end of the building instead of at the main switchboard, at a point most convenient for

the walls and monitor may be thrown open in hot weather.

The floors of the main shop are constructed of asphalt block, while the floors of the heat-treating department, which contains two large capacity Tate-Jones furnaces as well as smaller furnaces, and the forge room are laid with a hard paving block, and those of the warehouse, lavatories, tool-supply department and boiler and fan rooms are concrete.

The entire main building is heated by forced draft from two low-pressure steam boilers of 100 hp. each. The heat is forced by a large Sturtevant fan through concrete heat ducts which are located under the floor, next to the outside walls, and extend the entire length of the building on both sides, delivering the heated air through cast-iron double-throw outlets located at wall columns about 45 ft. apart.

The lavatory arrangements are noteworthy for an unusually light and airy atmosphere. In the wash room, white enamel fixtures and a concrete floor permit of unusual cleanliness and neatness. There are over 250 steel lockers for workmen in this room, each man having a locker, and the room is under the control of the day patrolman and open only before work in the morning, at the noon hour, and after working hours, thus preventing a



General Plan of the Duff Jack Factory, Showing the Telferage System

large amount of lost time, which is common where wash and locker rooms are continually open. Fire hose and sanitary drinking fountains are located conveniently throughout the building. The water supply is worked out jointly with the Pittsburgh Screw & Bolt Company, water being pumped from two deep wells into a 130,000 gal. tank and supplying both plants, although city water service is regularly connected and is always available in case of emergency or when desired. Drinking water is sterilized and then cooled at a central cooling box.

The time clock arrangement is somewhat unusual in that the clock automatically rings the men in and out. The clock is electrically connected so that in the morning, at noon and at night it rings a large gong at the prescribed times and controls the working hours and noon hour exactly and automatically, which is not always possible when attended to by the engineer, aside from saving the time of any individual whose duties may include this responsibility.

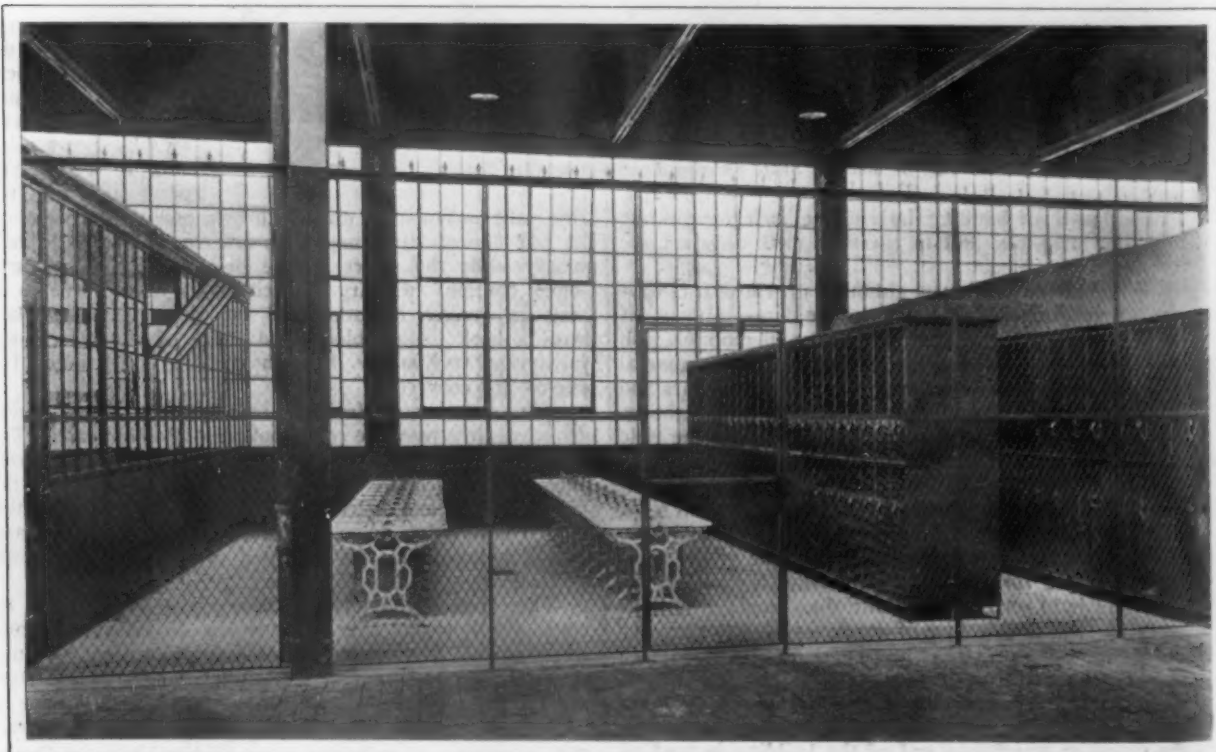
The prevention of accidents to employees has been given careful attention in the Duff plant. The company has adopted the universal danger sign of the National Association of Manufacturers, which is a large solid red circle painted conspicuously at every point of danger. Regardless of his nationality, every employee can distinguish and is made to know this sign as indicating possible danger, whereas it frequently happens that employees cannot read the word danger even though the precaution is taken to print it in several languages. Furthermore, all switch boxes, motor starting boxes, gears, pinions, fly-

wheels, etc., are inclosed with wire screening of close mesh to prevent accidental injury.

The general scheme of the new building was determined from working conditions by the Duff Mfg. Company itself. The engineers for the plant were the W. G. Wilkins Company, Pittsburgh; J. F. Kuntz was architect and James Stewart & Co., New York and Pittsburgh, were general contractors. The electrical installation was done by the Carter Electric Company, Pittsburgh.

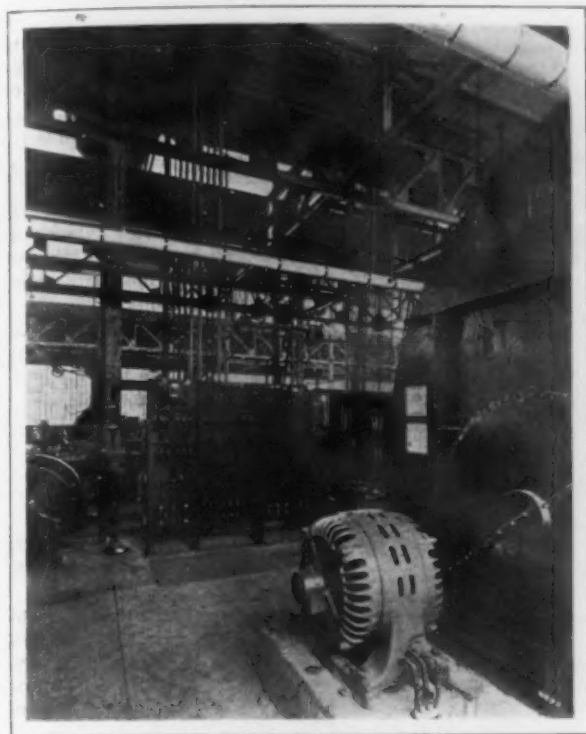
The Duff Mfg. Company is conspicuous internationally as a manufacturer of lifting jacks. It makes practically every type of lifting jack in sizes varying from the smallest automobile jack with a capacity of 1200 lb. to a hydraulic jack of over 500 tons capacity. One of its products is the Barrett jack, including track jacks, automatic lowering jacks for lifting purposes and geared ratchet jacks of 25 tons, 35 tons and 40 tons capacity, for heavy car and locomotive lifting work. The Duff company also makes ball-bearing screw jacks of 10 tons to 75 tons, including those termed the high speed type. Its line covers also the Duff-Bethlehem forged steel hydraulic jack, in capacities of 10 tons to 500 tons, and the Dunn and Alliance extensible trench braces, formerly made by the Dunn Mfg. Company, which was merged with the Duff Mfg. Company July 1, 1912. The Barrett automobile jack is obtainable in about 28 sizes varying from 1200 lb. to 10 tons. The company has also brought out recently a new pressed steel motor jack of entirely new construction, on which it has secured both design and mechanism patents.

The officers of the company are: John R. McGinley,



Lockers and Wash Basins of the Partitioned Service Room

president; Thomas A. McGinley, vice-president and general manager; D. J. Greiner, assistant treasurer; F. O. Graham, secretary; I. E. Hindman, general superintendent, and E. A. Johnson, general sales manager. Plans are now being made for the election of a large factory in the Chicago district to take care of the Western trade, and



View in Boiler and Fan Room of the Duff Jack Factory. Chain Drive to Fan Runs in Oil in Safety Guard; at Left is Chain-Driven Air Compressor

this is expected to be completed and in operation late this year. To take care of the Canadian trade a factory is to be built either at Windsor or Hamilton, Ont., ready for operation in the late fall.

Motor-Driven Bar Twisting Machine

For twisting the steel reinforcing bars employed in concrete construction, the Lewis Foundry & Machine Company, Pittsburgh, Pa., has built a motor-driven machine. It is claimed for this machine that the trouble experienced with belt-driven units on account of belt slippage causing unnecessary strain during the twisting process has been overcome, since the gear connection used for transmitting power from the driving motor to the machine insures a constant torque being applied while the bars are being twisted. The machines are arranged for two speeds and

will twist either 1 or $1\frac{1}{4}$ in. bars, a complete twist being made in 10 in. on the smaller bar and in $12\frac{1}{2}$ in. on the larger one.

In this machine, which was built at the company's works at Groveton, Pa., steel castings are used for the twisting heads that are arranged to receive tool steel dies for bars ranging from $\frac{3}{8}$ to $1\frac{1}{4}$ in. Brass bushings are provided for the bearings and the shafts are turned and hammered open-hearth steel. The bed is made of 10-in. channels which are long enough to accommodate 60-ft. bars. The tailstock is arranged so that it can be locked on the bed at any distance from the headstock. An index is furnished for registering the number of turns made by the bar twisting head. The dial is reset by hand and can be moved back to zero when the load is released.

The twisting speed of the head is about 60 r.p.m. for $1\frac{1}{4}$ -in. bars, the operation requiring about 1 min. Twice that time is consumed in placing the bars in the machine and removing them after the twist is completed, so that a complete cycle of operations occupies 3 min. The machine is driven by a Westinghouse mill motor, a 75-hp. unit being used for twisting five $1\frac{1}{4}$ -in. bars, and a 60-hp. one to handle the same number of $1\frac{1}{8}$ -in. bars.

Adding Oxygen to Air Blast

Charles A. Edwards, manager of the Britannia Iron Works, Middlesbrough, England, after various experiments, comes to the following conclusions regarding additions of oxygen to the air blown into blast furnaces:

1. According to the amount of oxygen added to the air-blast, there results a blast furnace gas which has the composition of the best producer gases and also the same adaptability.

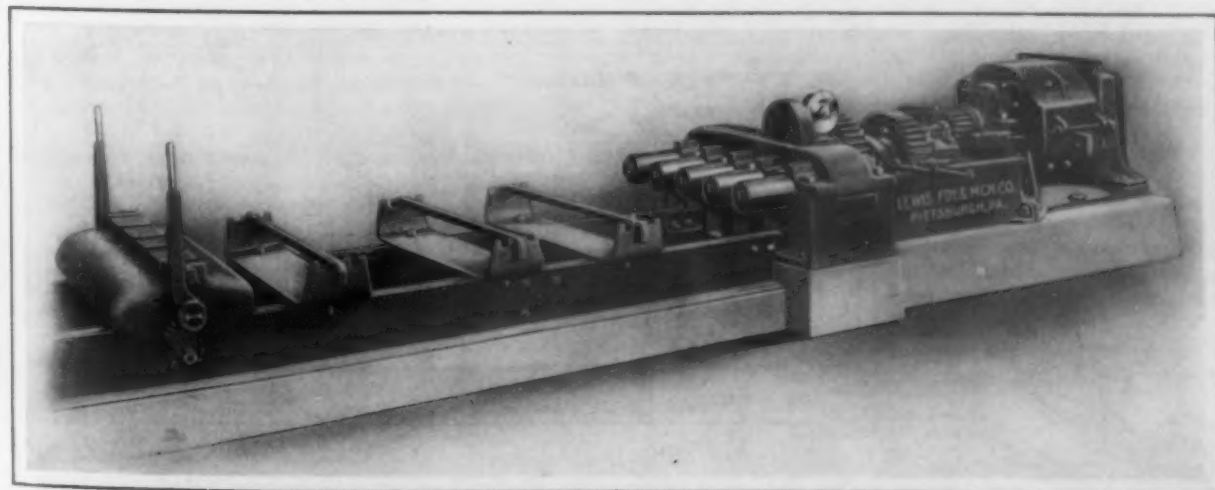
2. By increasing the oxygen content from the normal of 21 per cent. by volume to 22.54 per cent. by volume, thus lowering the nitrogen content, the demands on the blast and on the stoves are reduced about 8 per cent., and the coke consumption lessened about 6 cents per ton of pig iron.

3. The volume of the gas is lessened by the lower percentage of nitrogen, the velocity up through the various layers of the charge is slower, and the reducing power is increased.

4. The efficiency of the blast furnace is greater by about 23 per cent.—about 8 per cent. because of lessened demands on the blast and about 15 per cent. because less coke must be gasified.

5. These figures will naturally be altered some according to conditions in various plants, but the question of the increase of the oxygen content of the air blast should be given earnest consideration for the above reasons.

M. A. Hanna & Co. moved into their new quarters in the Leader-News Building, Cleveland, Ohio, March 24. They will occupy the entire thirteenth floor of that building. About April 15 the Republic Iron & Steel Company will move its Cleveland office from the Citizens' Building to the Leader-News Building.



A Motor-Driven Machine for Twisting the Reinforcing Bars Used in Concrete Construction

An Interesting Conveyor Installation

A Twist in the Coal Run a
Feature—Dustproof Car for Ashes

The coal and ash handling apparatus installed in the power plant of the new print works of the Pacific Mills, South Lawrence, Mass., by the C. W. Hunt Company, West New Brighton, N. Y., possesses a number of interesting details which are not usually seen in such installations. It is made up of three distinct systems for bringing the coal from the cars to the storage bins, taking it from the bins to the boiler room and removing and distributing the ashes. Fig. 1 is a view of the top of the coal bins, and the path of the conveyor is shown in Fig. 2, which is a plan and elevation. The special type of dust-proof car used for handling the ashes is illustrated in Fig. 3.

The first portion of the apparatus consists of a pivoted bucket conveyor which receives the bituminous coal from the railroad cars and distributes it to the storage bins.

The fuel is brought to the plant in railroad cars and is discharged through the hoppers in the bottom into a pit under the track. The

of Fig. 1. When the conveyor reaches the top of the vertical run it passes forward over the top of the distributing chutes, each of which has an automatic trip, so that the fuel can be discharged from the conveyor buckets into any chute desired. The motor employed for driving the conveyor is shown in the central portion of this cut with the empty buckets passing underneath it. The twist

in the conveyor, which is a feature of the installation, is shown in this engraving and also in the left of Fig. 2.

In addition to the regular coal bins, which are filled by the distributing chutes, shown in Fig. 1, there is an auxiliary row of storage bins at the extreme left of the building. For filling these bins, the conveyor is arranged to discharge into an auxiliary hopper which in turn discharges into an electrically operated 2-ton car running on a track over the storage bins. Although

the combined capacity of these bins is 10,000 tons, they are so subdivided that in case the coal commences to heat and there is any danger of fire from spontaneous combustion,

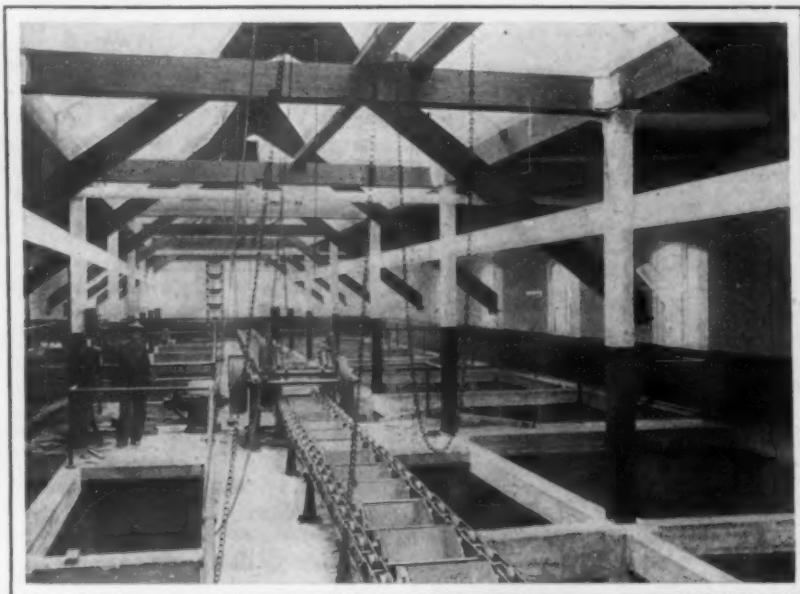


Fig. 1—View of the Top of the Coal Bins. The Vertical Run of Conveyor Buckets in the Rear Passes Up Over the Distributing Chute and the Empty Buckets Are Shown Returning in the Center

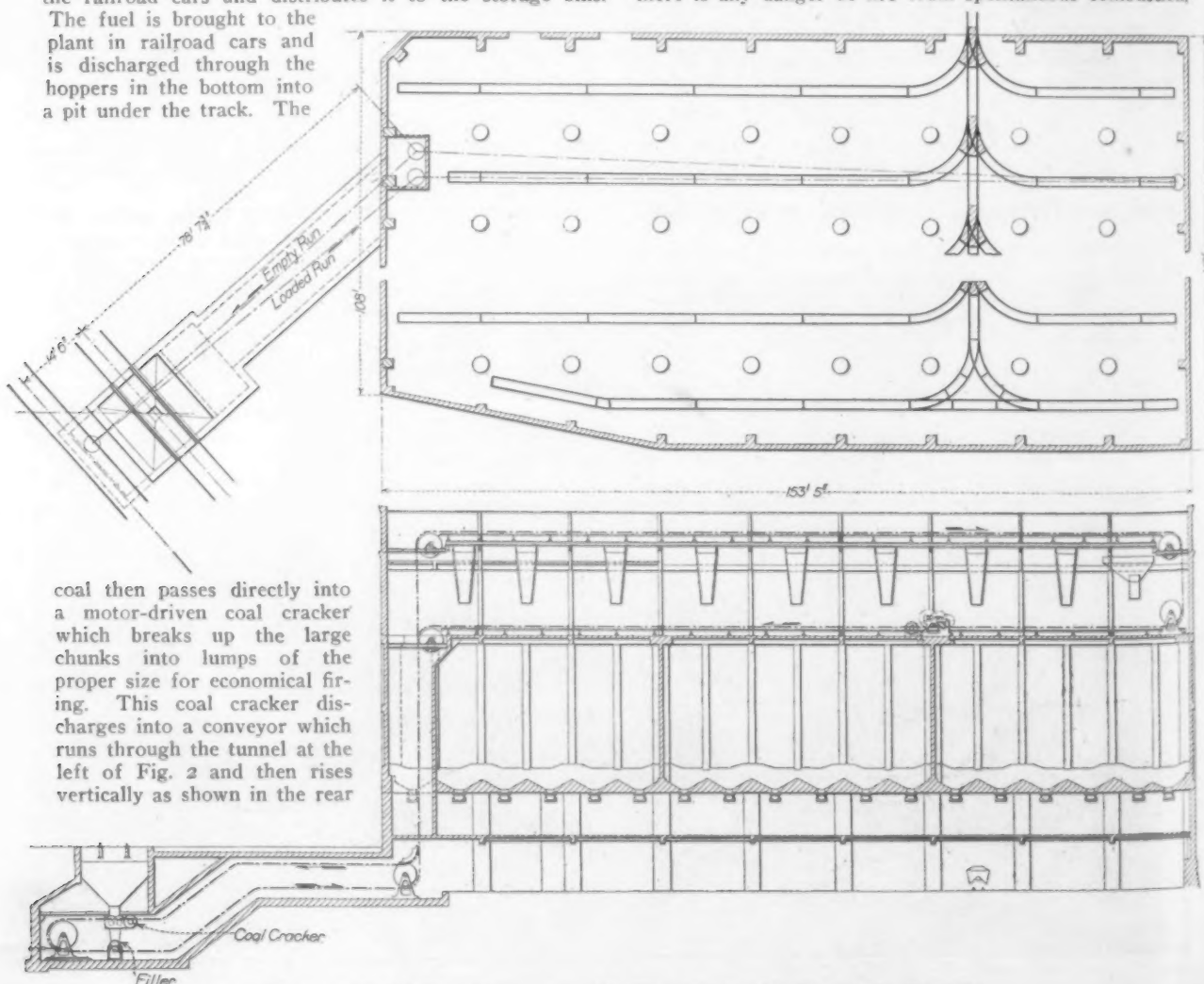


Fig. 2—A Partial Plan View and an Elevation Showing the Path of the Conveyor

the individual bin can be emptied in a very few minutes.

From the bins the coal is drawn off through duplex valves into boiler room charging cars, which have a capacity of 1 ton and can be filled in less than a minute. These cars are pushed by hand over industrial railroad tracks to the boiler room. The tracks in the boiler room are so located that it is simply necessary for the fireman to drop the side of the car and shovel the coal directly into the fire. In this way the fuel is not spilled on the floor, and it is possible to keep the boiler room neat. The charging cars are made of sheet steel, reinforced with angle iron, the corners being rounded off so as not to hurt the employee's hands and the bottom flush riveted. When the side door is dropped for firing, the bottom of it is slightly higher than the floor of the car so that the fireman will not catch his shovel when scooping up the coal. It is pointed out that the construction of these cars is such that they are the right height and distance from the firedoor to reduce the fireman's work and increase his coal handling capacity.

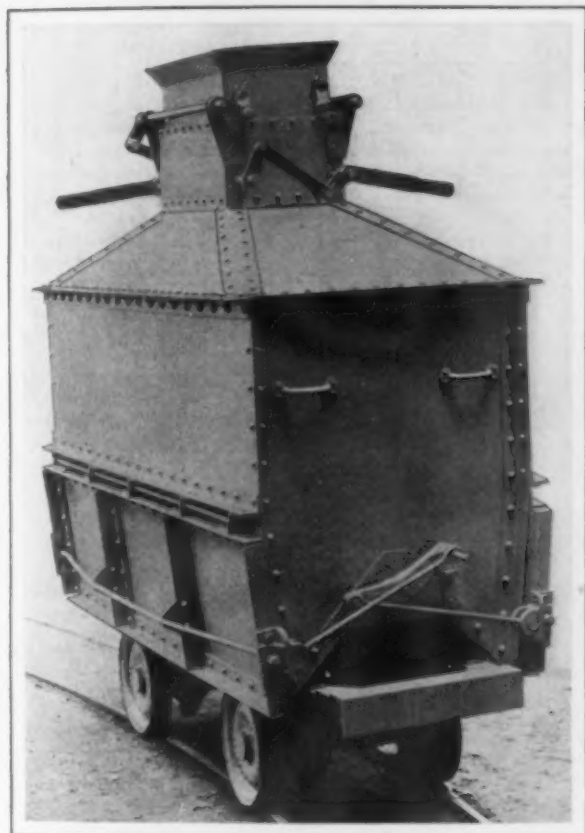


Fig. 3—The Special Dustproof Car Used for Handling the Ashes

The capacity of the coal handling equipment is between 60 and 70 tons per hour, which is calculated to be more than ample to keep the 30 boilers of the plant supplied when running at full capacity.

From the boiler the ashes pass downward to a room below the boiler room, spouts conveying the ashes directly into the cars. As soon as an ash car, shown in Fig. 3, as mentioned, is run under an ash hopper, the lever at the top of the car is pulled down and a telescoping spout on the car is shoved up and encircles the bottom of the hopper, thus preventing the ashes from flying around.

The conveyors, charging and ash cars, coal and ash valves, tracks, etc., were supplied by the C. W. Hunt Company, under the direction of the consulting engineers, Lockwood, Green & Co. The coal pockets which are of reinforced concrete were built by the Aberthaw Construction Company, Boston, Mass.

The Medicine Hat Radiator Company, Medicine Hat, Alberta, Canada, mentioned in *The Iron Age* of March 27, page 810, plans to have a plant equipped with all modern machinery and will mold its radiators on a molding machine of new design recently patented by Carey Wright, Sauk Center, Minn., who will have charge of the manufacturing end of the new business.

Flexible Shaft with an Improved Core

A new type of flexible core and a special terminal clutch are features of a flexible shaft being placed on the market by the Plank Flexible Shaft Machine Company.



Fig. 1—A New Type of Flexible Shaft Having a Special Clutch and an Improved Core

Grand Rapids, Mich. The core is made up of small units, and the shaft can be used for transmitting power from electric motors mounted on trucks or on benches. A view of the shaft connected to a portable electric motor is given in Fig. 1, while the construction of the flexible core is brought out in Fig. 2.

The core involves interlocking joints so that a continuous core can be assembled without the use of rivets or pins. This construction also renders the units readily interchangeable, either for varying the length of the shaft or for making repairs. The core is protected in the ordinary way by a spiral spring steel coil covered with leather. The shaft is connected to the motor with a universal joint, thus avoiding sharp bends at that point.

The clutch is made in three telescoping parts and the sleeve is secured to the driving member by a knurled collar which has a pin operating in a slotted sleeve. In this way the flexible shaft is connected or disconnected from the grinding wheel, portable drilling machine or other



Fig. 2—Drawing Showing the Construction of the Flexible Core

tool by simply turning the collar. The core can be released and drawn out of its protecting covering for oiling or repairs by loosening a set screw.

The officers of the American Pulley Company were hosts at a banquet held at the Germantown Cricket Club of Philadelphia April 1. C. A. Brinley, president of the company, presided and gave out some extremely cheering intelligence regarding the employees' beneficial fund, which is now being set aside for the sole benefit of the employees. Plans were discussed looking to the greater development of the company. The welfare of the men, who have helped make the company, was carefully considered. Horace Sheble, an expert on efficiency, gave an interesting talk on methods to be pursued. The committee in charge of the entertainment consisted of William R. Simpson and J. W. Muir.

The Swedish Iron & Steel Corporation, 12 Platt street, New York, has opened a branch warehouse and sales office at 1280 Ontario street, Cleveland, Ohio. The office is under the management of B. A. Maase.

New Type of Reciprocating Air Pump

The Use of Multi-Port Plate Design
Automatic Valves a Special Feature

The Mesta Machine Company, Pittsburgh, Pa., recently placed on the market an improved type of reciprocating air pump, in which there are no mechanically operated valves on the air cylinder. This type of air pump, assembled on the builder's erecting floor, is shown in Fig. 1, while curves indicating the efficiency of this type of pump as compared with that of the rotary type are reproduced in Fig. 2.

Multi-port plate type automatic valves are used on the air cylinder. It is pointed out that they require no attention or oiling and will open and close at the right time independently of any adjustment. Flash ports and the large clearance spaces due to them, which were encountered in the earlier types of reciprocating air pumps, have been done away with. It is claimed that the type of valve has been very successful on blowing engines and air compressors.

A test for reliability and economy was made at the builder's works by Prof. W. Trinks, of the Carnegie Institute of Technology. A large tank was used for converting the pulsating suction of the air pump into a steady flow so that the actual quantity of air taken into the pump could be measured by a standard nozzle. To make the conditions under which the pump was tested identical with those encountered in condenser practice, which is the field for which these pumps are intended, a nozzle was provided on the air tank through which the vapor could be admitted. A steam cylinder was installed between the pump and the air tank, and the steam passing through it was condensed at atmospheric pressure in a surface condenser located in the pit under the flywheel, the water of condensation being measured. In making this test, special care was taken to measure the amount of leakage which existed when the valves on the air tank were closed.

To furnish a means of comparison between this pump and those of the rotary type, the ratio of the ideal work required for isothermal compression divided by the actual work required was plotted against the vacuum referred to a 30-in. barometer. The curves plotted show the efficiency of this new pump, that of the most advanced type of rotary air pump and also two average pumps. The data for plotting these last three curves were taken in the first case from the report of a test published in technical papers and the others were furnished by the builders of these pumps.

As will be noted for any vacuum below 29 in. of mercury, the single-stage reciprocating air pump is superior to the rotary type and the difference is considerable for any vacuum below 28½ in. Above 29 in. the efficiency of

single-stage air pump drops rapidly. The rotary air pumps are commonly driven by small steam turbines, while the reciprocating pump is driven by a thoroughly economical

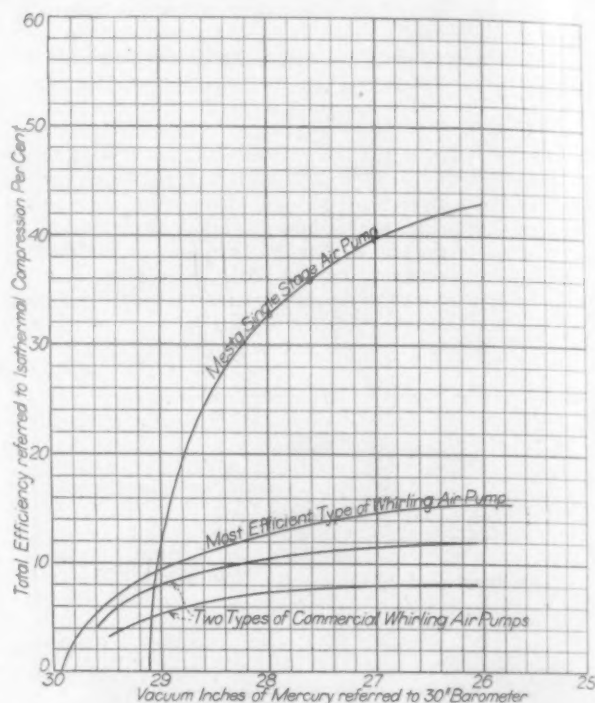


Fig. 2—Test Curves Showing the Comparative Efficiency of the Various Types of Pumps

type of engine, having a steam consumption per horsepower hour of approximately one-half that of the turbine. When this fact is taken into consideration the difference in efficiency is even more pronounced. It is stated by the builder that the particular field for which the new pump is recommended is where there is a sufficient amount of exhaust steam to heat the feed water available from sources other than the engine exhaust. Where the exhaust of the prime mover is necessary for heating purposes, the rotary type of pump is recommended in spite of its lower efficiency.

The city of East St. Louis, Ill., has raised a fund of \$50,000 which will be utilized in a publicity campaign with the special purpose of acquiring manufacturing industries. Steel plants and machine tool plants will be sought especially.

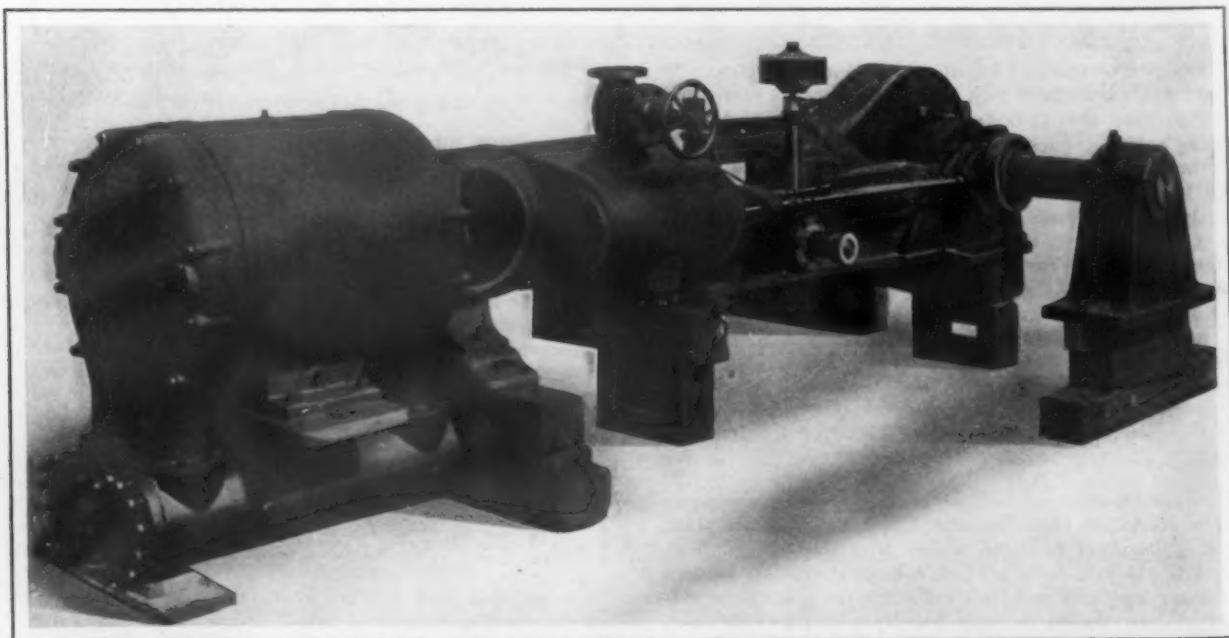


Fig. 1—A New Type of Reciprocating Air Pump with Multi-Port Plate Views Assembled on the Builder's Erecting Floor

New Large Rack-Driven Slotting Machine

The Newton Machine Tool Works, Inc., Philadelphia, Pa., has recently redesigned its rack-driven slotting machine. In the new design of the machine, which is of massive construction throughout, care was taken to cover all the exposed parts. A view of the machine from the operating side is given in Fig. 1, while the rear of the machine is shown in Fig. 2.

An oil pan which is cast solid surrounds the circular table and its circumference is divided into graduations of 1 deg. each. Corner clamps serve to hold the circular table to the cross saddle. Square lock gibbed bearings on the base are furnished for the cross slide, and all adjustments are made by taper shoes. Hand control is provided for all of the table movements, and the motions are controlled independently by feed gears which can be removed and changed.

A relief tool apron with vertical and horizontal faced steel clamping surfaces is carried by the cutter bar which is counterweighted and is driven by a coarse pitch steel rack. The dogs A and B, Fig. 1, have vertical adjustment on the bar, and the length of stroke is controlled by tripping the pawl C. This pawl is connected to the master switch D and the rod E governs the control of the bar travel. Square lock bearings in the adjustable support which in turn is bolted to the upright are provided for the cutter bar. From the motor pinion F, Fig. 2, the drive is through the gears G and H to the bull gear meshing with the cutter bar rack and mounted on the shaft I, Fig. 1. At J, Fig. 2, motion for the feed is taken from the gear H and is carried to the machine to support the reverse box K, Fig. 1, which is arranged to give a variable stroke to the pawl controlling the

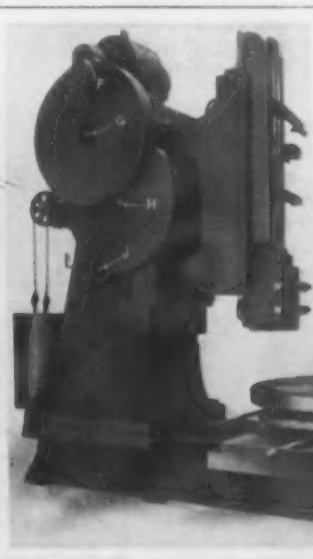


Fig. 1—View from the Operating Side.

Fig. 2—Rear View of the Machine.

Two Views of a Large Redesigned Slotting Machine Driven Through a Rack by a Reversing Electric Motor.

reversing, circular, and also the in and out and cross feeds.

The machine, which is driven by a Westinghouse 10-hp. reversing planing machine electric motor, has a maximum stroke of 33 in. The over-all diameter of the circular table is 54 in. and 6 in. less over the T-slots. The length of the cross and in and out feeds is 40 in. and the distance from the face of the ram to the frame is the same. The maximum height under the frame is 48 in. The machine requires a floor space of 14 x 4 ft. and its approximate net weight is 46,000 lb.

Structural steel manufacturers of Louisville, Ky., are investigating the question of obtaining a transit privilege, whereby after fabricating their material they may be able to ship it to destination on a through rate. It is expected that some such arrangement will be granted, as the Pennsylvania and some other lines permit transit arrangements at Indianapolis.

The Baldwin Locomotive Works, Philadelphia, has received orders for 25 locomotives from the Grand Trunk Railway, Canada, and for 20, 9 of which are of the switching type, from the Atlantic Coast Line. The plant continues fully engaged. No definite plans have yet been announced in connection with the company's Western plant.

Demonstration of Talking Moving Pictures

Through the courtesy of the American Talking Moving Picture Company and Thomas A. Edison, a private demonstration of the Edison kinetophone was given in the Engineering Societies Building, 29 West Thirty-ninth street, New York City, on Friday evening, April 4, to the members of the American Society of Mechanical Engineers, American Institute of Electrical Engineers and American Institute of Mining Engineers.

Miller Reese Hutchinson, Mr. Edison's engineer and personal representative, explained what was being done in the educational moving picture field to reproduce chemical, physical, biological and industrial processes. It is the intention to send these reels out for use in schools and educational institutions as an aid to the regular textbook instruction; a scenario, which is to be read by the instructor, accompanying each film. In the making of these films, in a number of cases, small, transparent models were used.

Among the educational reels shown were one of the formation of crystals by evaporation, drying, cooling, etc.; one on magnetism, including a demonstration of the principle upon which the Edison magnetic separator for iron ore operates; one showing the operation of the various types of pumps, and one dealing with the making of steel in a Bessemer converter.

The second part of the demonstration consisted of a series of kinetophone pictures, in which absolute synchron-

ism was obtained between the motions of the actors and their voices and other incidental sounds. Among the actions which were shown were the playing of musical instruments, singing and pistol shots, as well as the human voice. In this connection, Mr. Hutchinson explained that

while it was possible to have vocal or instrumental music played in synchronism with a moving picture, it was extremely difficult to synchronize the talking voice. Between the different reels, selections were rendered on the new Edison disk phonograph, using a new material known as condensite for the record.

Automobile Makers Are to Investigate Fuels.—Arrangements have been made between the National Association of Automobile Manufacturers and the Society of Automobile Engineers to study the applicability of kerosene and other low grade petroleum products to the automobile and generally of developing substitutes for gasoline. The automobile engineers are to take up the more technical features of the research work, while the manufacturers, of course, will attend to the commercial side. The investigation is to include carbureting devices.

The Wheeling Sheet & Tin Plate Company, Wheeling, W. Va., which is building a plant at Yorkville, above Martins Ferry, Ohio, is booking orders. It will begin manufacturing about July 1. The mill is above the flood lines of 1884 and 1913. It would have required 9½ ft. more water than the recent flood to put the plant out of commission.

Growing Use of Commercial Motion Pictures

Notable Development, a Projecting Machine of Small Size Found Effective in Demonstrating Machinery to Prospective Buyers

It is widely known how motion pictures are used in the lecture room and before scientific and trade associations to give realistic representations of methods and operations carried on in manufacturing plants and in connection with general engineering work, even for advertising purposes. Not so well known is the fact that motion pictures are employed in even more vital contact with commerce and that they give promise of speedily becoming a most important accessory in selling various tools, appliances and machinery. In the marketing of some products the use of the pictures is past experiment and it is now believed in some quarters that in effecting sales the motion picture projector will become exceedingly important. The manufacture of projecting machines has been carried to a point of refinement where they are made of such small dimensions that one can be carried by a salesman on his travels and a prospective buyer in his own office may sit at ease while he is shown the artificial counterpart, photographed in action, of a machine or process. It requires but a few minutes for attachment to an electric light fixture, the drawing of window shades to darken the room, adjustment of the projector and the throwing of the pictures on a wall or small screen carried for the purpose.

Interiors Require Special Lighting for Making Films

The possibilities in the making of films for such displays has already been perceived by experts in their production and they have embarked in the business of making them for the exclusive use of manufacturers and sales agencies. R. W. Davis, manager of the negative production department of the Knickerbocker Film Company, New York, in an interview on films and their production, said:

"Films of exterior views demand only the usual amount of good daylight for satisfactory photographic results; but interiors having sufficient light for the ordinary manufacturing process, and in which the ordinary still photo can be made with a time exposure, do not afford the amount of illumination or actinic light value necessary for moving picture work. To obtain this light an equipment to supply the added artificial light must be used. This equipment is arranged in portable form so that it may be moved from place to place in any industrial plant.

"For convenience in handling and to comply with the regulations of fire underwriters, the standard length of films for a single reel has been set by custom at 1000 ft. There are 16 distinct and separate pictures to each foot of film, and it requires from 17 to 18 minutes to project 1000 ft. of film on the screen. A 1000-ft. reel may tell a story, show a process of manufacturing, or the operation of machinery, and may consist of 20 to 50 different scenes or views. In making films the views need not be taken in the order in which they appear in the finished picture. The camera operator to save time and shifting of apparatus will take as many views as necessary in one spot. These views are afterward assembled or spliced to make the finished film, with the proper consecutive arrangement of scenes.

"Until the introduction of moving pictures into the industrial field, the manufacturers of derricks, steam shovels, etc., were often confronted with the proposition of exhibiting their product to prospective customers. Now the same manufacturers may have films

made of their product in actual operation whether they be at work on the Panama Canal or in Timbuctoo."

Some Instances of Motion Pictures in Industry

The Holt Caterpillar Company, Peoria, Ill., and the Holt Mfg. Company, Stockton, Cal., which manufacture the Caterpillar traction engines, have equipped their offices in several cities with Edison picture projectors and business callers may have illustrated before them in a brief time a great deal that can be better told in pictures than in words. They can see where the tractors are made, how they are tested before shipment, how they cross a wide ditch, ascend steep grades and go down others, how trees are pulled down and tree stumps removed on the site, for example, of the Ashokan reservoir, how the engines travel over sandy and marshy ground and also pull from 12 to 18 plows and do other agricultural work. A series of films showing logging operations in Michigan are now being made.

In a recent campaign by the Bethlehem Steel Company for business in South America, pictures of the Bethlehem plant were shown to give an adequate idea of the magnitude of the operations of the company. In this connection it may be remarked that the pictures speak a universal language and are as impressive with the merchant of South America or the Orient as with the man at home.

The C. W. Hunt Company, West New Brighton, Staten Island, New York, has made use at various times of a series of pictures showing the operation of freight-handling equipment which it manufactures.

Brick-making Machinery and Paving Illustrated

The American Clay Machinery Company found that it could use motion pictures to advantage. Prospective buyers of improved brick-making machinery were scattered all over the country and in some cases were thousands of miles away and to take them to the machines would be not only a costly and troublesome proposition, but would take busy men away from their daily routine, if they could get away at all. To overcome the difficulty the company had films made and these were exhibited to the probable buyers.

The Dolarway Paving Company's films showing the complete method of laying its pavement, from the preparation of the subgrade to the application of the finishing coat of bitumen, has enabled the company, it is emphasized, to demonstrate to city engineers, boards of estimate, etc., that are in the market for paving, just how the work is handled and the reasons for the claims for superiority. The value of this film was appreciated by Prof. Blanchard, of Columbia University, where it was shown recently to the class in Highway Engineering, Major Crosby, of Baltimore, delivering the address on "What a Highway Engineer Should Know."

The films of the Goldschmidt Thermit Company, illustrating its method of electric welding, are well known, as are those of Rogers, Brown & Co., entitled "From Mine to Molder," which, as has been mentioned several times in *The Iron Age*, have been viewed by thousands.

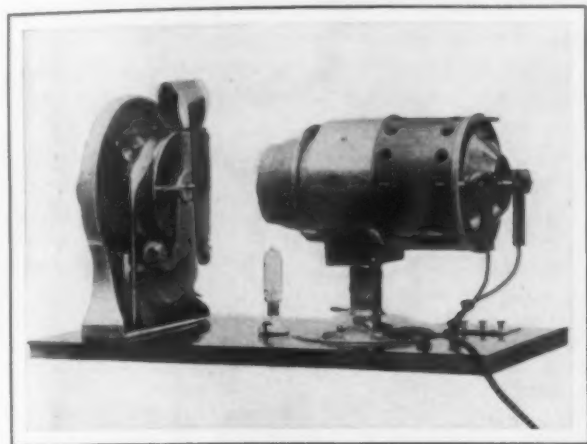
Motion Films in Time and Motion Studies

Mr. Davis referred to the studies of F. B. Gilbreth and J. G. Aldrich at the



Reproduction Exact Width of Film Taken for the Goldschmidt Thermit Company

plant of the New England Butt Company in Providence, looking toward the solution of more efficient production and their use of motion pictures to this end. "A large clock was installed," he said, "the single hand of which makes a complete revolution in 6 sec., the



Portable Projecting Machine for Motion Pictures, the Standard About 15 In. in Length

face being divided into parts which will indicate thousandths of a minute. Each motion in any operation can be timed, and photography by moving pictures reproduces in absolute time and motion each operation. A magnifying glass is used to study these movements, instead of the ordinary method of projection."

Railroad Firemen to Be Instructed with Pictures

Preparations are now under way, Mr. Davis said, by the Baltimore & Ohio Railroad for an efficiency campaign and incidental to it film studies are to be made showing the proper method of firing a locomotive boiler, etc. Those in charge of this phase of the investigation believe that the coal consumption on the road will be greatly decreased as a result of the use of the films. The Union Pacific Railroad uses motion pictures in connection with an educational campaign to induce industrial enterprises to locate along its line. An automobile company which has a very large output had pictures taken showing every process in the manufacture of its cars, beginning with the laboratory where tests of steel are made, and showing operations in foundry, forge and machine shops, etc. Originally the intention was to show these films only to salesmen and dealers, but so great was the demand from all who heard of the pictures that it was finally decided to exhibit the films in a large number of cities in the United States and Europe. Theaters were engaged for the purpose and usually filled to their capacity and the company considered the whole proposition a convincing sales argument.

Some indication of the convincing power of the films rests in the fact that the 1913 convention of the Associated Advertising Clubs of America is to be held at Baltimore this year. At last year's convention in Dallas, Texas, the Baltimore delegation won in the contest over choice of convention city largely because it displayed moving pictures of its home city. These films belong to the city of Baltimore. While some of the contestants were telling what their cities had to offer, the Baltimore men were actually showing Baltimore. Only a few instances have been mentioned of the uses made of motion pictures in selling. They have been utilized in the sale of automobile oils, borax, fountain pens, milk and soap, but their widest application undoubtedly will be in the mechanical field.

The negotiations between W. N. Parkin and other Pittsburgh men and the citizens of Canal Dover, Ohio, for the establishment of a sheet steel plant in the latter city have been declared off, the local committee having decided to reject the proposition made by the promoters. It is probable that efforts will be made in Canal Dover to organize a company for building a steel plant which will be entirely under local control.

New Line of Bench Type Grinding Machine

Four sizes of a new design of small grinding machines have been placed on the market by the Ransom Mfg. Company, Oshkosh, Wis. They are provided with guards which can be readily attached or removed. Fig. 1 is a view of the machine equipped with a plain rest, and an end view showing the wheel guard is given in Fig. 2.

The machines are made with self-oiling adjustable cast-iron bearings and self-closing nickel-plated oil holes and covers. The grinding wheel arbor is made of 0.45 per cent. carbon steel and is finished by grinding. Means are provided for taking up wear and the caps are fitted by a tongue and groove into the frame.

The machines, unless specially ordered, are shipped without guards, but equipped with rests, as shown in Fig. 1. These rests are made in one piece adjustable for different widths and diameters of grinding wheels. When wheel guards are required, the rests are removed and the guards fastened on in the same way as the rests. As shown in Fig. 2, the guard and the work rest have been combined in one casting.

Four sizes of machines are built, designated as the 8, 10, 12 and 14 in. sizes, according to the diameter of the wheel used. The following table gives the principal dimensions and specifications of the different sizes:

Diameter of grinding wheel, in.	8	10	12	14
Face width of grinding wheel, in.	1	1 1/2	2	2 1/2
Hight to center of spindle, in.	4 1/2	6	7	8
Spindle diameter between collars, in.	3/4	7/8	1	1 1/8
Diameter of collars, in.	2 3/4	3 3/4	4	4 1/2
Diameter of arbor pulley, in.	2	3	3 3/4	4 1/2
Face width of arbor pulley, in.	2 1/2	2 3/4	3 1/4	3 3/4
Diameter of countershaft pulleys, in.	4	6	6	6
Face width of countershaft pulleys, in.	2 1/2	3 1/4	3 3/4	4 1/4
Speed of countershaft, r.p.m.	475	475	500	510

These machines can be supplied with a column base, as shown, in which case the hight of the spindle center above

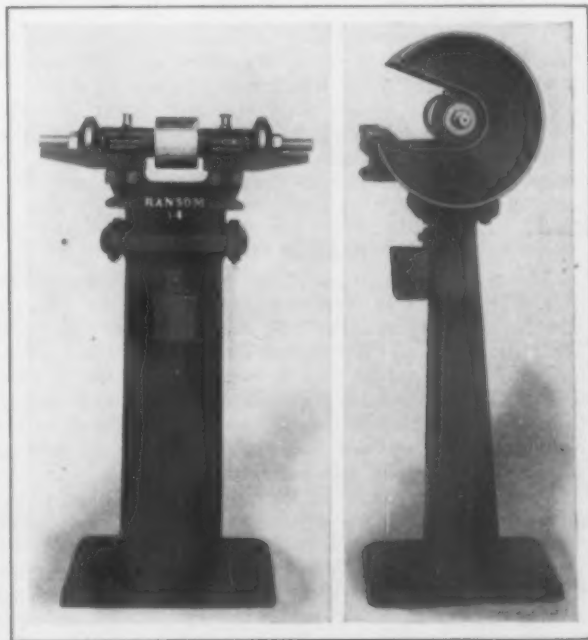


Fig. 1—Equipped with Plain Rest Fig. 2—Equipped with Wheel Guards

Two Views of a New Line of Small Grinding Machines

the floor is 39 in. in the 8 and 10 in. machines and 37 and 38 in. in the 12 and 14 in. sizes respectively. If desired, the machine can be supplied without the column and is then mounted on a bench.

The United Steel Company, Canton, Ohio, has completed the construction of its new 10, 14 and 20-in. bar mills. They are of the latest design and are operated by electric motors. The company will make a specialty of rolling high-grade steels on these mills and they will be "cross rolled" in accordance with its own process. The output of the mills will be chrome-vanadium steel, high-grade forging stock, spring bars and alloy steels. The company will be in position to make prompt shipment of the finished bars.

Chemical Reactions of the Puddling Process*

Important to Have Sufficient Readily Fusible Material Rich in Ferrous Oxide at an Early Stage of the Operation

—BY PROF. THOMAS TURNER†—

Though the puddling processes are, chemically speaking, the application of a number of oxidizing reactions whereby the impurities originally present in the pig iron are removed, the direct effect of the oxygen of the air is relatively small. In fact, atmospheric oxidation must be regarded rather as a source of waste metal than an action to be encouraged or increased. During remelting no doubt a certain amount of metal is oxidized as it is gradually heated and ultimately fused. A still greater oxidation usually occurs during the balling-up stage of the operation, and practically the whole of this oxidation leads to loss of iron.

The fettling of the furnace, so long as it remains hard and infusible, is also without any important action on the metal. The temperature of the furnace when the metal melts is probably about 1300 deg. C., and during the hottest part of the heat, just before the metal is withdrawn, is probably very little, if any, above 1400 deg. and at this temperature ferric oxide is infusible. The most active agent in the purification of the iron is the bath of fluid slag, or cinder, into which the crude metal trickles as it melts, and by which it is covered during the subsequent stages of clearing and boiling. For many metallurgical purposes a fluid slag may be considered to consist of three separate parts:

1. A fusible portion, usually a silicate, which takes no direct part in the reactions, but may be regarded as a solvent or mother liquor.

2. An active agent which is dissolved by the solvent and thus brought into intimate contact with the metallic or other substance upon which it is required to act.

3. The product of the reaction, which, when non-volatile, accumulates in the cinder until at length a proportion is reached which prevents the proper progress of the reaction. It corresponds with the waste products of a living organism, which, if not removed, ultimately lead to death.

Puddling Cinder

The three parts of puddling cinder are respectively:

1. The solvent is ferrous silicate $2\text{FeO} \cdot \text{SiO}_2$, which, when pure, melts at about 1183 deg. C., as determined by Mr. Dixon in my laboratory some years ago. When melted, it is almost as fluid as water; on cooling it gives a very distinct arrest at its solidifying point, and crystallizes in dark, semi-vitreous plates which belong to the rhombic system, and which occur in nature as the mineral Fayalite. It contains 70.6 per cent. of ferrous oxide and 29.4 per cent. of silica. In its pure form it is rather too infusible, and much too siliceous to form a good cinder.

2. The active agent is magnetic oxide of iron, which consists of Fe_3O_4 , or $\text{FeO} \cdot \text{Fe}_2\text{O}_3$. One method of preparing magnetic oxide is by heating ferric oxide to its melting point, when oxygen is given off and magnetic oxide results. In practice, however, it is very seldom that magnetic oxide possesses exactly the composition which corresponds with the formula Fe_3O_4 . It may still be attracted by a magnet, or even become distinctly polar, and show its characteristic crystalline form, while the proportion of ferrous oxide varies considerably from that required by the formula. We may, therefore, speak of the active agent which is dissolved in the ferrous silicate by the less definite term of "oxide of iron," it being understood that by this name is indicated a more or less altered form of ferric oxide.

Ferrous silicate can readily dissolve either silica or oxide of iron. The addition of silica gradually raises the melting point and makes the material viscous when hot, and slow-setting like a glass. With sufficient silica a dark olive-green bottle-glass is obtained. This has no definite melting point, and gives no arrest on the cooling curve. The addition of oxide of iron first slightly lowers,

and then gradually raises the melting point until ultimately the temperature of 1565 deg. C is reached with pure ferric oxide.

It is known from steel works practice that in order to remove phosphorus from the metal the silica in the bath of slag must not exceed 20 per cent., and this limit is probably rather too high for safe working. Since ferrous silicate contains 29.4 per cent. of silica, it is evident that it must dissolve half its weight of oxide of iron, at least, in order to make a satisfying cinder. Puddling cinder is thus a very strong solution of oxide of iron. This solution coming in contact with iron, when both are in the fluid state, is practically without action on the metal, since a metal cannot reduce its own lower oxide. It does, however, rapidly oxidize the non-metallic impurities—carbon, silicon, and phosphorus, while even sulphur is also removed. Puddling cinder doubtless acts as a carrier of oxygen from the air to the metal, though the extent to which the action takes place has not been carefully determined. Puddling cinder also contains relatively small quantities of lime, alumina, manganous oxide, and other impurities derived from the fettling, and these tend to lower the melting-point. Actual determinations in my laboratory, by Mr. Coe, have given a solidifying point of 1075 deg. C. for tap-cinder.

3. The product of the reaction which is present in the cinder is phosphorus, in the oxidized condition, probably as normal triferrous phosphate $\text{Fe}_3(\text{PO}_4)_2$. Several important researches have been published in reference to the condition in which phosphorus exists in the basic slag from steel-making. Dr. Stead has isolated and recognized a tetra-basic phosphate. Tap cinder does not appear to have received the same careful examination; it is found from analysis that the phosphoric oxide does not usually reach 7 per cent., and its presence appears to increase the fluidity of the cinder, though exact information on this point is lacking. If the pig-iron used is high in phosphorus it is well to concentrate this as far as possible in that portion of the slag which is first removed, and which usually boils over the fire-plate. The removal of the impurities at this stage is economical in fettling, and yields a better ultimate product.

It has been assumed in what has hitherto been stated that the active oxide of iron is wholly dissolved in the slag. There is some evidence that metallic iron can dissolve oxide of iron, though apparently not in large quantity. The subject is now receiving attention by investigators.

Pig Iron for Puddling

Before considering the reactions further it may be well to say a few words as to the composition of the pig-iron to be employed. Even when the ironmaster has, in his own mind, a definite ideal composition, he is not always able to get exactly what he wants, and is certainly not able always to insure regularity in character. One advantage of the use of three or four brands of pig-iron in a heat is, no doubt, the greater uniformity thus insured, as it is unlikely that all of them will vary in the same way at the same time. Fortunately the puddling process lends itself to considerable modifications in detail, so as to suit different classes of iron; otherwise it would long ago have passed away. A typical iron may have approximately the following composition:

	Per cent.
Carbon, chiefly graphitic.....	3.5
Silicon	1.5 to 2
Phosphorus	1
Manganese	0.75

and other impurities as low as possible.

It is generally a mistake to attempt to puddle with too pure an iron, and this for two reasons. In the first place, the metal costs more to buy, and yields less weight in the furnace. Secondly, it is apt to work "dry," and to be red-short in the subsequent processes, while the bottom of the furnace is apt to scurf. But the improve-

*Part of a paper read before the West of Scotland Iron & Steel Institute at Coatbridge, January 11, 1913.

†Professor of Metallurgy in the University of Birmingham.

ment due to silicon and phosphorus is only obtained within certain definite limits. With too large a proportion of metalloids the extra time occupied and fettling melted may more than compensate for the initial gain.

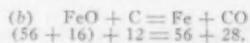
Steps in the Process

Let us now imagine our furnace is hot and properly fettled, and the pig-iron is weighed out and ready to be charged. The first step usually is to charge in some shovelful of cinder, such as the slag obtained from the forge hammer. On this the pig iron is charged, care being taken to place any pigs which have a higher melting point in a position in which they will get the most heat, so that as far as possible all may melt down together. Since the cinder melts at about 1100 deg. and the pig-iron usually at over 1200 deg. C, it will be found that the cinder is fluid before the iron is melted, and the metal therefore trickles down into a pool of slag. Possibly the phosphide eutectic tends partially to liquefy out before the rest of the pig-iron melts, but in any case the metal at once comes in contact with a basic liquid rich in dissolved oxide of iron. Much of the phosphorus is at once given up to the slag, but the remainder passes away slowly during the rest of the process. Silicon and manganese rapidly pass out of the fluid metal, and are usually practically gone within 10 to 15 minutes after the whole of the iron is melted. Until the whole is well and uniformly fluid and "cleared," the carbon is not attacked; but when once clearing is completely finished the object is to bring on the "boil" as quickly as possible.

Allowing our minds to picture the meeting of an atom of carbon with the surrounding fluid containing oxide of iron, we see that several things are possible. It might, for example, meet one molecule of ferric oxide, when we should have



and the result would be that one molecule of carbon monoxide would be evolved and burn in the blue jets of the furnace, while two molecules of ferrous oxide would be added to the slag. So far as yield is concerned, there would be no gain of iron, but a loss exactly equal to the amount of carbon removed. On the other hand, our atom of carbon might meet a molecule of ferrous oxide, when we should get

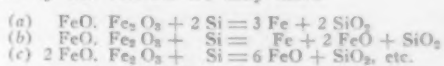


In this case we should still get the same amount of carbon monoxide, but nothing would be added to the slag, while 12 parts of carbon would add 56 parts of iron to the yield. But since 12 parts of carbon would be lost, the net increase of weight would be 44 parts. Hence each part of carbon removed would take from the fettling and cinder and add to the charge no less than $3\frac{1}{2}$ times its own weight of iron.

These equations represent the worst and the best of what may happen. But other actions are also possible, such as—

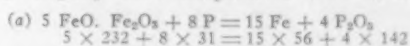


Similarly for silicon we may have

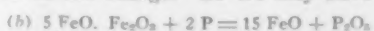


From this it will be seen that as the oxide of iron increases the yield decreases, exactly as was the case with carbon.

The reactions with phosphorus are of the same character though slightly more complicated in form, thus



hence 248 of phosphorus reduces 840 parts of iron from the cinder and fettling, or one part reduces 3.4 parts of iron. Subtracting the loss of one part of phosphorus we have that each 1 per cent. of phosphorus adds 2.4 per cent. of iron to the charge. Or we may have



in which case 62 parts of phosphorus will use up 1160 parts of oxide of iron, or nearly 19 times its own weight and add nothing to the yield.

It will therefore be seen that under certain specified and favorable conditions, carbon, silicon, and phosphorus can be removed, and their places taken by a greater weight

of iron obtained from the fluid bath of cinder. The ideal condition is by the reduction of ferrous oxide, as this contains least oxygen. In this case, after allowing for the loss due to the removal of the non-metallic element itself, 1 part of carbon may add $3\frac{1}{2}$ its own weight of iron, silicon 3 parts, and phosphorus $3\frac{1}{2}$ parts. Or, conversely, these non-metals may be oxidized in such a manner as to use up many times their own weight of oxide of iron, and add nothing whatever to the charge. In practice it may be assumed that we always work under some intermediate conditions, and though some metal should be gained, the quantity never reaches the theoretical maximum.

Control of the Reactions

From a practical point of view the question naturally arises: How far the reactions are under control, and what are the conditions which insure the best results? An examination of our equations will show that in all cases where there is no iron added to the charge the quantity of oxide of iron, and particularly of ferric oxide, is excessive. So long as other conditions, such as time, remain constant, any excess of ferric oxide diminishes the yield. It also tends to make the cinder less fusible, and the iron dry under the hammer. It may, however, quicken the rate of reaction in many cases. If the total oxide of iron which is present in the cinder during the boil be separately estimated as ferrous and ferric oxide respectively, it will be found that there are in every 10 parts about 9 of ferrous oxide and 1 of ferric oxide. The cinder which is tapped out at the end of the process contains about twice as much ferric oxide, which is in the proportion of about 5 parts of ferrous oxide to 2 of ferric oxide. Within these two limits we have the usual working composition.

We have, however, already seen that ferrous silicate dissolves about half its own weight of oxide of iron in the formation of puddling cinder. We may hence assume that, in the first case just mentioned, of the 9 parts of ferrous oxide about 6 were present combined with silica, and 3 in the free or dissolved condition. The composition of the active oxide of iron would therefore be approximately $6\text{FeO} \cdot \text{Fe}_2\text{O}_3$. Similarly, the composition of the active oxide of iron in the second case would be approximately $2\text{FeO} \cdot \text{Fe}_2\text{O}_3$. By thus eliminating the ferrous silicate from the calculation, the difference in composition of the dissolved oxide in the two cases is made more evident, and it will be seen that any explanation, such as was formerly in vogue, based merely upon the reactions of Fe_2O_3 , must be misleading.

The practical application of these considerations is that care should be taken when puddling impure irons to provide a sufficiency of readily fusible material rich in ferrous oxide, so as to give a fluid bath of cinder early in the melting-down and clearing stages. Such cinder assists in the rapid purification of the iron, increases the yield, and is the cheapest and readiest means of properly working a charge. If there is a deficiency of cinder in the early stages, more has to be made at the expense of the iron and of the more infusible fettling. The making of cinder in this way leads to waste of time, metal and fuel, and should be avoided as far as possible.

The presence of a reasonable proportion of non-metals in the original pig-iron not merely increases the yield of puddled iron, for reasons above given, but also improves the fluidity of the cinder, and hence the proper working of the charge, and the quality of the product. An all-hematite charge, for example, is unsatisfactory. The metalloids diminish the ferric oxide in the cinder, while the products of the oxidation of silicon and phosphorus also tend to give a slag with a lower melting point than a purer material would possess.

It may perhaps be supposed that if it is good to have 1 per cent. of phosphorus and 2 per cent. of silicon, it may be still more advantageous to have yet larger proportions of metalloids. To this there are very definite limits in practice. It has been already shown that if the suitable proportions are not preserved as between oxide of iron and the metalloids, it is possible to use a great deal of fettling without gaining a single particle of iron. Cinder is also a slow conductor of heat, and a thick covering of slag prevents the iron receiving its proper share of heat. Hence too thick a coating of cinder is not good, particularly if that cinder is being made from the fettling by a "hungry" iron.

Determination of Chromium in Steel*

A Colorimetric Method Particularly Suited to Small Percentages

BY FRANK GARRETT†

A colorimetric method for the determination of chromium in steel, based on the use of Koenig's organic chromium reagent¹, has been in use in the writer's laboratory for some time, and has given such satisfaction that it was deemed worthy of publication. The organic reagent used disodium, 1.8 d. hydroxynaphthalene, 3.6 disulphonate, is extremely sensitive to chromate solutions, and the method has been very useful for detecting chromium and determining what might be considered small percentages of this element.

The usual colorimetric methods for chromium have not found application for this determination in steel. Hillebrand² has made use of the color imparted to alkaline solutions by hexavalent chromium for the determination of this element in rocks. This method applied to steels, however, would require too large quantities of the metal to be handled conveniently for routine determinations, especially for small percentages, as the yellow color of the chromate does not lend itself to comparison so handily as the pink color obtained in the author's method. Moulin³ has made use of the fact recorded by Cazeneuve that acetate of diphenylcarbazide gives a purple color with soluble chromates. The writer does not know of its being used for the determination of chromium in steel, however, nor could it be so conveniently applied as the colorimetric method described in this paper. The well-known Lehner test, making use of hydrogen peroxide and ether for the detection of chromic acid and chromates, is not capable of use, of course, as the blue color of the perchromic acid is not permanent.

The writer has occasion to make numerous determinations where the chromium runs 0.20 per cent. or under, and the results obtained by the method given below have been much more reliable than those obtained by other methods. The accurate determination of these small percentages of chromium is usually more troublesome than the larger quantities, but the new method takes care of these amounts very nicely. For determining the small quantities of chromium noted above, the writer has heretofore used McKenna's method⁴, and thinks it is uniformly more reliable than the other methods in vogue. The employment of concentrated nitric acid solutions and potassium chlorate is rather objectionable, however, and the method is not as convenient to handle as the colorimetric procedure described herewith. The color method is based on the fact that disodium, 1.8 dihydroxynaphthalene, 3.6 disulphonate, gives pink to cherry-red colors when added to acid solutions of chromate salts. It is short and accurate and, as used in the writer's laboratory on routine work, is as follows:

Steps in the Method

From 0.2 to 0.4 gram of steel, depending on the amount of chromium present, is dissolved in 10 c.c. of dilute sulphuric acid (1:3) in a 400 c.c. Erlenmeyer flask. For steels containing 0.15 per cent. chromium or under the writer uses 0.4 gram of steel; for larger percentages than this 0.2 gram is sufficient to work on. When the solution is complete, about $\frac{1}{2}$ c.c. of concentrated nitric acid is added and the solution boiled to near dryness to expel nitrous fumes and nitric acid. No more nitric acid is used than is necessary to oxidize the iron, as the presence of much free nitric acid interferes with the chromium color by giving it a brown tint. It is best to use a small marked tube that will deliver just about $\frac{1}{2}$ c.c. for each determination. After driving off the nitric acid, 50 c.c. of a 10 per cent. solution of sodium hydroxide is added, followed by the addition of about 1 gram of sodium peroxide, after which the solution is boiled for about five minutes. Since the reagent gives a color with only chromate solutions, there should never be any free peroxide left in the flask, as the subsequent acidification would cause a reduction of the chromium compound to chromic sulphate. It has always been found, however, that five minutes boiling is sufficient to decompose the excess of peroxide. The solution is cooled to room temperature and diluted to 200 c.c. in a volumetric flask; 100 c.c. is filtered from this solu-

tion and acidified by adding 2 c.c. of 85 per cent. phosphoric acid and 8 c.c. of concentrated sulphuric acid. The concentrated sulphuric acid is purposely used to heat the solution, as the color, on the addition of the reagent, develops more quickly in a warm solution than in a cold one. The solution should not contain more than 20 per cent., by volume, of concentrated sulphuric acid, as stronger solutions than this seem to bleach the pink color. Immediately after the acidification, 2 c.c. of a 1 per cent. aqueous solution of disodium, 1.8 dihydroxynaphthalene, 3.6 disulphonate, is added. A pink to cherry-red color develops, depending on the amount of chromium present. The solution is allowed to stand for at least 15 minutes and is then compared with a standard steel that has been treated in the same manner as the test.

The comparisons are usually made in a set of Camp's comparison tubes, although with very small percentages (say under 0.10) it is usual to use Nessler tubes. If a 0.20 per cent. standard is used it is diluted to 200 c.c. so that each cubic centimeter represents 0.001 per cent. chromium. The writer prefers to use standard potassium bichromate solution added to a chromium free steel as a source of standard, as the standard may then be varied to suit the composition of the steels being analyzed. The solution of organic reagents should be freshly made each day.

There is a very slight retention of some of the chromium by the iron precipitate. Experiments made along this line by taking samples through by the method described, and then comparing against pure solutions of potassium bichromate in sulphuric acid indicated that about 95 per cent. of the true chromium value was obtained. The chromium recovery was very uniform, however, and since the standard is given the same treatment as the test the results should be accurate within practical limits. That this is true is shown by Table 3.

The reagent gives a green color with ferric solutions, but this is instantly destroyed by adding phosphoric acid or strongly acidifying with sulphuric acid. The results have been found to be more reliable, however, in the absence of iron and for this reason the precipitated ferric hydroxide is removed by filtration. Tungsten and molybdenum do not interfere with the determination of the chromium in any way whatever. The addition of phosphoric acid prevents the precipitation of tungstic acid, and thus gives clear solutions for comparison.

Where Vanadium Is Present

Vanadium interferes with the method, however, by imparting a brownish tint to the pink chromium color. Pure vanadate solutions give light yellow to amber-colored solutions, depending on the amount of vanadium present. When determining chromium with moderate amounts of vanadium present the characteristic chromium color is but slightly changed, but the results are high as shown by Table 1. The samples were compared against a 0.30 per cent. chromium standard that contained no vanadium.

Sample No.	Per cent. vanadium present.	Per cent. chromium present.	Per cent. chromium obtained.	Per cent. error.
1	.10	.20	.23	+ .03
2	.10	.30	.31	+ .01
3	.15	.30	.35	+ .05
4	.15	.30	.34	+ .04
5	.20	.30	.37*	+ .07

*Difficulty in comparing owing to solutions being of different shade.

The results in Table 2 also show the influence of vanadium on the determination of the chromium. The samples were compared against a 0.25 per cent. chromium standard that contained 0.15 per cent. vanadium. It will be noted that the samples containing more than 0.15 per cent. vanadium were high, while those containing less than this amount were low.

Sample No.	Per cent. vanadium present.	Per cent. chromium present.	Per cent. chromium obtained.	Per cent. error.
6	.10	.20	.18	-.02
7	.10	.20	.18	-.02
8	.10	.25	.23	-.02
9	.10	.30	.24	-.06
10	.20	.20	.22	+ .02
11	.20	.20	.21	+ .01
12	.20	.25	.28	+ .03
13	.20	.30	.34	+ .04

The color due to vanadium is only obtained in acid solution of the pentavalent compounds, and is quite characteristic. As a matter of fact, a few experiments made with pure vanadate solutions indicate that the reaction is

*From the Journal of Industrial and Engineering Chemistry, April, 1913.

†Firth-Sterling Steel Company, McKeesport, Pa.

quantitative, and is almost as sensitive as the well-known hydrogen peroxide test for this element.

The addition of the reagent to slightly acid solutions of quadrivalent titanium gives brick red colors that are destroyed by adding hydrofluoric acid, or strongly acidifying with mineral acids. Concentrated sulphuric acid solutions of titanium, however, give pink colored solutions. The reaction for titanium is much more sensitive than the hydrogen peroxide test, but the percentage of free acid presents has a very marked influence on the color, and it is not thought that a reliable quantitative method could be developed owing to this fact. Titanium would not interfere with the chromium determination in the method as given, of course, as any titanium present would be precipitated and removed by filtration.

Close Results on Small Chromium Content

The writer does not think that the method given above is more advantageous for determining large percentages of chromium in steel (say over 0.60 per cent.) than Galbraith's or some such modification, but it seems to be particularly suited for small percentages of this element. Table 3 shows some results obtained by the new method.

TABLE 3.

Sample no.	Weight of steel taken, grams.	Per cent. tungsten present.	Per cent. molybdenum present.	Per cent. chromium taken.	Per cent. chromium obtained.	Per cent. error.
14	2.0	...	...	.012	.012	+ .001
15	.4	...	...	.03	.03	none
16	.4	...	...	.06	.06	none
17	.4	...	...	.09	.09	none
18	.4	...	...	.15	.15	none
19	.4	...	...	.20	.20	none
20	.4	...	...	.30	.31	+ .01
21	.4	...	...	.50	.49	-.01
22	.4	...	...	.70	.70	none
23	.4	...	...	1.10	1.10	none
24	.4	...	...	1.40	1.38	-.02
25	.4	5.5	...	.20	.20	none
26	.4	5.5	...	.30	.29	-.01
27	.4	20.0	...	.20	.20	none
28	.4	20.0	...	.25	.24	-.01
29	.4	...	5.0	.20	.18	-.02
30	.4	...	5.0	.30	.29	-.01
31	.4	...	10.0	.20	.18	-.02
32	.4	...	10.0	.25	.25	none

(1) Chemischer Zeitung, 1911, 35, 277.

(2) Journal American Chemical Society, 1898, 20, 277.

(3) Bulletin Société Chimie, 1904, 31, 295.

(4) Chemical News, 80, 2, 67.

The result on sample No. 14 was obtained by making an ether separation of the ferric chloride solution, and then replacing the hydrochloric acid with sulphuric acid. The chromium was then oxidized with sodium peroxide in an alkaline solution, and the small amount of ferric hydroxide removed by filtration. The solution of sodium chromate was then acidified with sulphuric acid, the chromium reagent added, and the color matched against a pure solution of potassium bichromate in sulphuric acid.

By taking larger quantities of steel, as in the case of sample No. 14, there is no difficulty in determining 0.001 per cent. chromium. Such a minute quantity of chromium in steel has no metallurgical significance whatever, of course, but the analyst is often called upon to look for very small quantities of metals, and it is a pleasure to have a method that will detect them without difficulty.

The writer is indebted to his assistant, D. J. Giles, for performing much of the experimental work leading up to the perfection of this method.

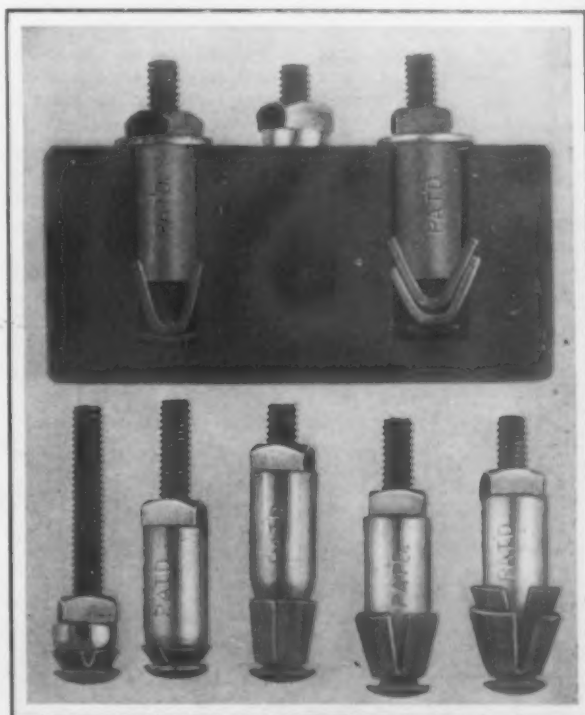
Announcement is made of the formation of the Metal Treating & Equipment Company, Inc., with offices in the United States Rubber Building, 1784 Broadway, New York City. The incorporation is under the laws of the State of New York, with a capital stock of \$100,000. The purpose of the company is primarily to exploit its patented processes and solutions for electro-galvanizing, both in installing job galvanizing plants or special plants for its customers. The claim is made that the company's solutions permit the deposition of any desired amount of zinc, always of good structure.

To secure additional working capital, the Elyria Iron & Steel Company, Elyria, Ohio, has decided to issue \$1,000,000 in common stock and reduce its preferred stock from \$750,000 to \$500,000, making the total authorized stock issued \$1,500,000. No plant extensions are planned.

New Device for Fastening Bolts in Masonry

The Paine Company, Corn Exchange Building, Chicago, Ill., has brought out an improved type of device for fastening bolts in brickwork. The new device involves an expansion shell to effect a positive hold by a longitudinal strain upon the attached material.

In the upper right corner of the accompanying illustration is shown a conical-shaped split-steel cup so placed that when expanded it will spread out in the form of flanges. This cup is made either to rest upon the head of the bolt or where a screw is used, the cup is threaded and runs on the screw like a nut, the operation of the shell being the same in either case. Following the cup is a sleeve with a taper end which fits into the shell. When the cup and the sleeve are in place, the bolt is dropped into the hole and the nut turned. In this way the tapered end of the sleeve spreads as it is forced into the cup, and its edges cut into the side of the hole. Where great resistance is required, two or more expansion shells can be used, this arrangement being plainly brought out in the engraving. Any desired length of sleeve can be furnished and when the work is not very deep the cup is made correspondingly



An Expansion Shell for Fastening Bolts Into Brickwork by Imposing a Longitudinal Strain Upon the Surrounding Material

shallow. The way in which the grip of the expansion shell is obtained is such that the strain put upon the bolt is resisted by a direct pull of the cup edges embedded in the material. As there is no bursting action, it is claimed that this expansion bolt may be used where the material walls around the hole are comparatively thin without danger of splitting.

This device is made in thirty-two sizes for bolts and screws ranging from 3/32 to 3/4 in. in diameter and is furnished in either brass or steel. One of the special fields for which it is used is the anchoring of rails in concrete without ties, for setting wheel guards and steel door frames in brick walls and for holding small high-speed motors on wood and concrete foundations. The shells are made to fit all the standard sizes of bolts and screws, these being obtained by the user from the regular source of supply.

The New Haven Iron & Steel Company, New Haven, Conn., after an idleness of about two years, has put in operation its mill for rolling bar iron. It has a monthly capacity of about 2000 tons. A. K. Barker has been appointed manager of the works.

The Watson-Stillman Company has moved its Chicago office from the Rookery to the McCormick Building.

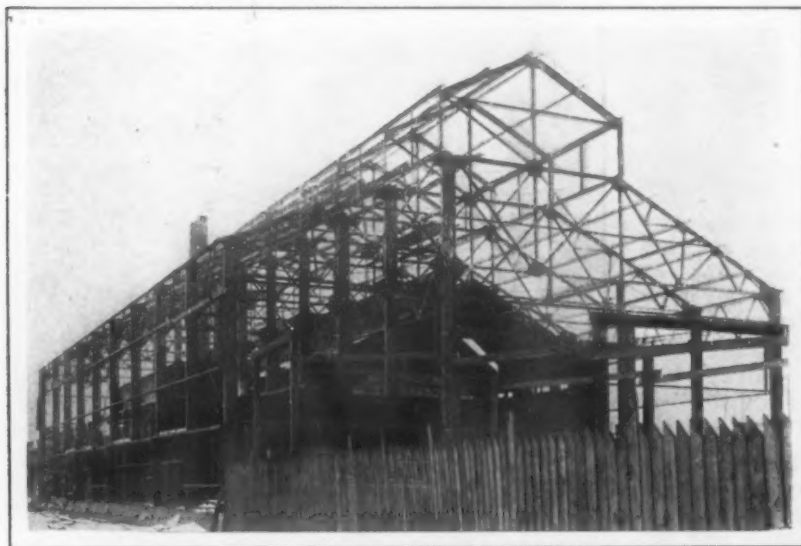
Erecting One Building Around Another

How the Champion Machine & Forging Company, Cleveland, Is Enlarging

An interesting and unusual method of factory erection adopted by the Champion Machine & Forging Company, Cleveland, Ohio, is shown in the accompanying illustration. This company recently decided to replace the old drop forge shop with a larger and up-to-date plant. The company desired to build on the site of its present factory but did not want to discontinue business for several months, which would have been necessary had it torn down its old plant to provide a site for the new. Accordingly a plan of erecting the new building over the old plant was worked out, the latter remaining in full operation while the new was being built.

The old shop occupies a building 63 x 100 ft., half of it being 28 ft. high and the remainder 14 ft. The new plant is 70 x 144 ft. in size and 32 ft. high to the eaves. The illustration shows the structural steel frame work of the new building erected over and around the old plant and about ready for the walls and the roof. The vertical columns of the new structure surround the old building, and one row of 28-in. interior columns was placed within the old building, holes being cut through the roof to allow for their erection. It was also necessary to cut holes through the roof to permit placing steel trusses for the new building.

In erecting, four columns and beams for the section of the building on the portion of the site not covered by the old building were put in position, after which the erecting boom was placed on the top of this portion of the structure. From this elevated position the boom handled the remaining steel for the building. Before the photograph was taken shaft hangers for the new plant had already been



Enlarging the Plant of the Champion Machine & Forging Company Without Stopping Manufacturing Operations

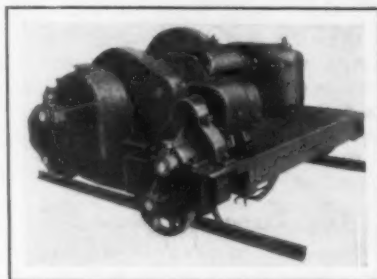
affixed along the interior columns above the roof of the old building.

The old plant has been in operation since the erection of the new one was started. When the roof and walls are in place the old building will be torn down and the location of the present power and machinery equipment will not be changed with the possible exception of moving two or three hammers. It is expected that changing over from the old to the new building will cause a shut down of not over two or three days. The structural steel is being erected by the Forest City Steel & Iron Company, Cleveland.

G. H. Clamer, Ajax Metal Company, Philadelphia, has obtained a patent on replacing part of the nickel in nickel steels with low nickel contents by varying amounts of copper. The latter, it is claimed, raises the elasticity and tensile strength of such nickel steels without lowering the ductility. Carbon can be as high as 0.50 per cent. The patent covers alloys as high as 6 per cent. in nickel and 2 per cent. in copper.

Traveling Crane Trolley with Inclosed Gears

A new design of inside and inclosed gearing trolley having a capacity of 10 tons is being manufactured by the Whiting Foundry Equipment Company, Harvey, Ill. The gears are placed inside the main bearings and only two reduction gears and a simple wiring scheme are used.



A New Type of 10-Ton Inside and Inclosed Gearing Trolley for Electric Traveling Cranes

The trolley trucks are of I-beam cross-section and the gears are located inside the main bearings for their shafts, an arrangement which, it is emphasized, prevents them from working off and falling to the ground. The bolts for holding on the caps extend through the flanges, which permits an ordinary bolt to be used, and makes them very accessible. The mechanical brake of the hoisting mechanism is contained in a pocket in the truck, and the necessary adjustments can be made without removing the cover. When dynamic braking is used, the mechanical brake is omitted. There are only two reduction gears between the motor and the trolley axle and all the gear cases are of cast iron with horizontal machined joints. Ample openings are provided in each case for inspecting and lubricating the gearing. The boxes for the shaft are cast integral with the truck, and the caps are readily interchangeable for the drum and intermediate shafts. Cast iron with babitted shells is used for all the bearings except those for the axle, which are of bronze. These bearings are finished by turning on the outside and are fitted into bored boxes, large bosses preventing turning and grease cups supplying the necessary lubrication.

The cast trucks of the trolley frame are connected by a cast separator, machine finishing being done on all surfaces fitting together. Each end of the separator rests upon a ledge extending from the trolley side, an arrangement which eliminates shear on the connecting bolts. This is a regular feature of the builder's trolleys and gives a large platform for mounting the motors and the operating mechanism, as well as affording facilities for inspection by the attendant.

The simplicity of the wiring is a feature. Holes are provided in the trolley separator and the wires lead directly from the motors to the collector brackets attached to poles supported below the trolley frame. A limit switch which is operated by the block itself, is furnished in connection with the hoisting mechanism to prevent overwinding.

The Riter-Conley Mfg. Company, Pittsburgh, is furnishing the steel buildings for the new sheet and tin mill plant of the Trumbull Steel Company at Warren, Ohio. The warehouse and galvanizing building is 162 x 500 ft.; the hot tin mill building, 64 x 460 ft.; the main mill building, 236 x 600 ft., and the boiler house, 35 x 150 ft. All these buildings are of steel frame construction, except the boiler house, which is of brick, and 1315 tons of steel will be used in their construction. The company has also completed the erection of a plant for the Olympic Portland Cement Company at Bellingham, Wash., which consists of a raw mill building, kiln building, clinker and gypsum stores, a total of 930 tons of steel being used in these buildings. It is also fabricating and will shortly erect a steel building, 65 x 255 ft., for the Columbia Plate Glass Company at Blairsville, Pa.

An Improved Type of Power Hammer

Leather straps have been eliminated in the power hammer of the Fairbanks Company, Broome and Lafayette streets, New York City, and steel side arms and a spiral spring are employed to furnish the necessary elasticity. The hammers are built in two styles for either belt or direct-connected electric motor drive, the latter being illustrated in Fig. 1. Fig. 2 shows a piece of work turned out by one of the hammers with a marked saving in the time required.

The hammer is operated by adjustable crank and the crank pin slides in a groove in the crank disk, to allow the operator to vary the length of the stroke at will. The head or ram receives motion through a connecting rod with a cross-head fastened thereto. This head has a split sleeve and two side arms which in turn are directly connected to the ram by links that are hinged upon it. The use of a steel spiral spring, it is emphasized, enables the force and weight of the blow to be multiplied many times, but with an elasticity that removes danger of breakage. At the same time the jar is cushioned so that it is not noticeable in the machine when a blow is struck. The head strikes a quick, sharp blow at the rate of from 200 to 500 per minute, according to the size of the machine, and it is pointed out that it gets away from the work instantly, thus avoiding chilling of the stock.

The main frame has a circular opening in the back opposite the face of the dies, which permits the work to be run through from the front if desired. The head of the frame in which the crank shaft runs is solid, which, it is emphasized, precludes the possibility of cap bolts working loose or shafts getting out of alignment. Aside from this simplicity of construction, an effort has been made to reduce the number of parts as far as possible.

The working parts of the hammer are at the top in full view of the operator, and every part is readily accessible, thus giving ease of adjustment. The stroke adjustment is obtained by simply loosening one nut on the wrist pin and one bolt on the cross-head and tightening them when they have been moved to the proper position. The spring is adjusted at the factory to give the proper force to the blow, but washers are sent with the hammer, which can be inserted at the ends of the springs, if it becomes neces-

sary. The lower die block is keyed to the anvil block from the side, while the die is keyed to the die block from the front, an arrangement which permits the two parts to

be adjusted in opposite directions, thus bringing the dies in exact conformity with each other. This feature, it is pointed out, is an important factor, particularly where special shapes are formed partly in one die and partly in the other, and it is necessary that they be in perfect alignment to produce good work.

Steel castings are employed for the ram or hammer head, the links, the sleeve and the crank connection, while the crank, joint pins and side arms are of forged steel. Iron or steel is used throughout with the exception of the bronze bushing in the crank connection. By providing special dies, it is possible to



Fig. 2—A Sample of the Work Turned Out by this Hammer

adapt the hammer to a great variety of work. Among the forgings which can be turned out are carriage work, stone cutter's tools, edge tools, scythes, hatchets, shoe dies, welding gas tubes, etc. One of these hammers was recently installed in the shop of the New York Railways Company, New York City. Among the pieces turned out were rail-carrying tongs of the type shown in Fig. 2. These tongs are made from tire steel stock, 1 x 5 in. in cross-section, and it formerly took a man and two helpers 25 hr. to make one. With this hammer the time of production has been cut to 14 hr. and only one helper is required.

The Cost of Factory Sewage Disposal

An insight into the cost of providing for sewage purification in connection with the factory was given by Charles A. Blatchley, consulting engineer, Philadelphia, who read a paper at the Philadelphia Foundrymen's Association April 2, on the subject of "The Disposal and Purification of Factory Sewage and Wastes." As may be recalled, he is the designer of the sewage disposal plant installed in connection with the works of the Thomas Devlin Mfg. Company, at Burlington, N. J., described and illustrated at length in *The Iron Age* of July 13, 1911. The question is one of increasing importance, of course, due to the increasing necessity for preventing the pollution of water courses, and this is particularly true of the manufacturing institution isolated with regard to a general sewerage system, such as is already provided in the case of a municipality.

Admitting that the cost of the system depends on local conditions and on the character of sewage disposal system to be installed, Mr. Blatchley says that variation in cost per 1000 gal. disposed of per day lies between \$75 for the larger installations and \$150 to \$175 for the smaller institutions. For preliminary estimating, an installation cost of \$100 per 1000 gal. of sewage treated per day may, he said, be assumed.

The usual operating cost with a factory plant will be found to be one-fourth to one-fifth the wages of an intelligent laborer. Such plants, when properly installed, he says, rarely require more than two or three trips of inspection per day, when any necessary adjustments are made. During the remainder of the day, the laborer is available for other work. In most cases, he said, the maintenance charges are carried at 5 per cent. per year on the installation cost.

The Publicity and Industrial Bureau of Ottawa, Canada, has reprinted a clipping from *See America First*, which points out the progress that has been made by this city. There are a number of engravings showing the various parts of the municipality and some of its buildings, and one of the features of the pamphlet is a series of short paragraphs, giving the advantages of the city in a nutshell.

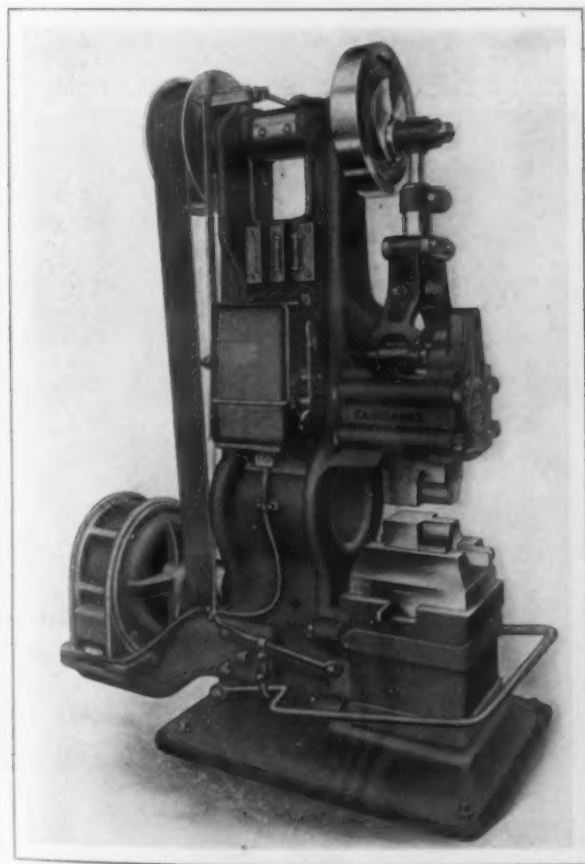


Fig. 1—A Motor-Driven Power Hammer in Which Leather Straps Have Been Eliminated and Steel Springs Substituted

The Improved Anderson Gear Rolling Machine

A number of important changes and improvements have been made to the Anderson gear rolling machine which was described in *The Iron Age*, November 3, 1910. It has also been made considerably larger with a view of making it better adapted for commercial purposes. Moreover, for marketing the gears made with this machine the Anderson Rolled Gear Company, Cleveland, Ohio, was recently organized with Harold N. Anderson, inventor of the machine, as president, and the company has commenced operation in a plant on Berea road, formerly occupied by the Cleveland Drop Forge Company. The company will also build the machines, and will shortly bring out a machine along similar lines for rolling bevel gears. The changes made since the bringing out of the original machine include the substitution of power for hand feed and the elimination of the break-down gear for doing the rough forming work, this gear being originally used for breaking up the metal and forcing out to a larger diameter. The entire work of forming the gear from the blank is now done on the finishing die roll. The finishing gear is mounted on the end of the driving shaft.

The blank is held between two chucks that are positively driven by two timing gears. The chucks are opened and closed by a double worm reduction gear with power feed. The carriage on which the chucks and gear blank are mounted oscillates on a pivot with a screw adjustment. The blank is fed into the die roll by power clutches that are belt driven from a lineshaft. The feed is reversed through a jaw clutch. One lever controls the chucks and another the clutches. An air blast, another feature, is provided on the die roll to clean off the scale. The die roll is made of an air hardening steel. After being used between 500 and 600 times the roll has shown no sign of deterioration. A handwheel adjustment is provided for changing stops and adjusting the machines for different diameters of gears. The timing gears are split so that they can be readily changed by an adjusting nut. The machine is driven by a 30-hp. direct-connected motor, separate power being provided for the feeds.

In operation the blank is forced into contact with the die roll until the proper depth of tooth is reached and also the proper diameter of the gear. The blank to be rolled is about the pitch diameter of the finished gear and spreads out under the rolling operation. The upsetting action on the teeth has been found to increase the density of the metal and thus the strength and wearing properties. For

high-grade machine work and other work where great accuracy is required it is planned to roll gears slightly over size on the flanks of the teeth which will eliminate turning operations on the blank as well as rough cutting operations. In cases where extreme accuracy is not required, the finishing cut is said to be unnecessary. The time required for rolling a gear is about 30 seconds and about the same amount of time is necessary to insert the blank and remove a gear. The machine has a capacity of gears ranging from 4 to 14 in. pitch diameter.

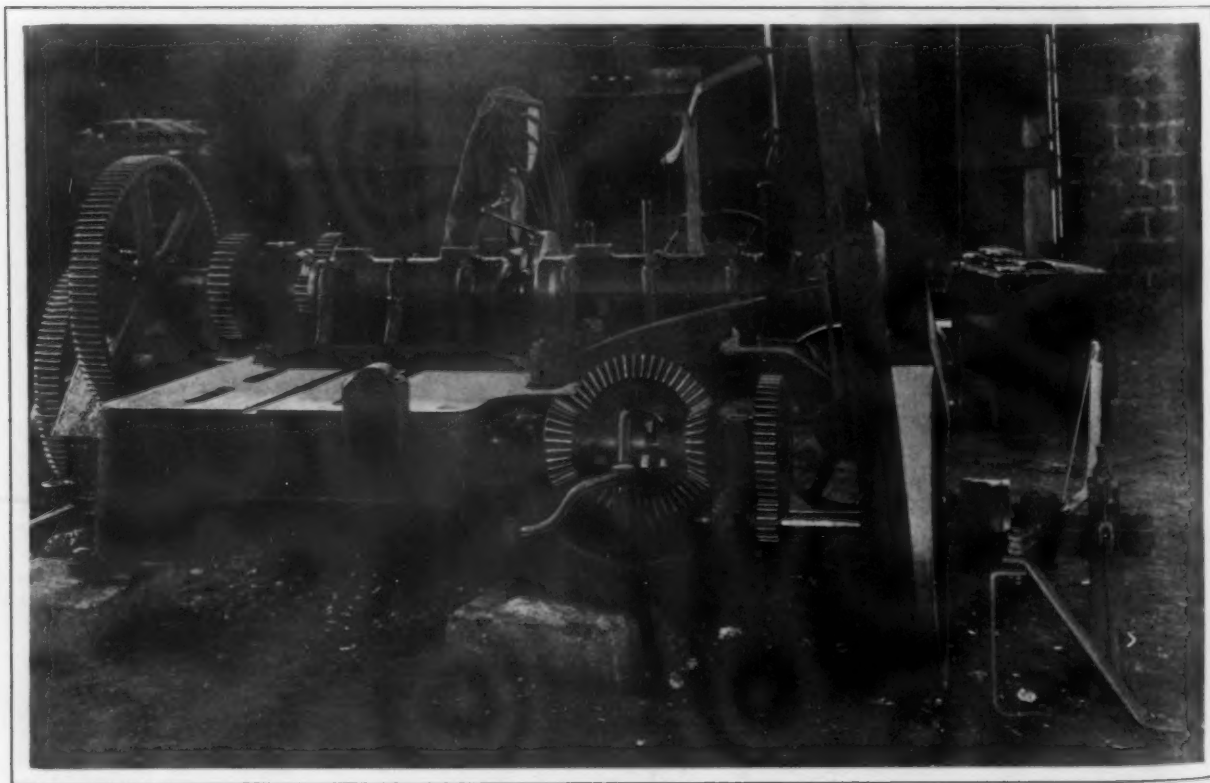
Tests of Vanadium Cast Iron

The Interborough Rapid Transit Company at its power plant at Fifty-ninth street and Eleventh avenue, New York, is installing some large low pressure engines in which are incorporated some 86-in. follow rings, made of vanadium cast iron. These rings are made by the Alloy Steel Casting Company, Wheeling, W. Va., which is also furnishing bull rings, piston ring pots and pistons of this same iron for these engines. A comparison of this product with the gray iron the Rapid Transit Company had been using is made in the following test data:

Test No.	Gray iron	Vanadium iron
1 Tensile strength, per sq. in.....	11,150 lb.	27,562 lb.
2 Tensile strength per sq. in.....	13,693 lb.	30,403 lb.

The test bar in each case was cut from the top scrapped cut of a 3000-lb. bull ring casting. The composition of this iron is not given. The manufacturers added vanadium to the iron in a specially designed portable furnace used as a ladle. The reserved or conserved heat is supposed to have peculiar advantages over the open ladle, doing away with the adding of the alloy to such ladle.

The annual meeting of the Bucyrus Company, South Milwaukee, Wis., manufacturing dredging and excavating machinery, developed the fact that in the fiscal year just closed there was an increase of 78½ per cent. in the total orders entered as compared with the previous year. The foreign business showed a remarkable increase, also, now forming 10½ per cent. of the total business of the company. Orders for machinery exclusive of repair parts increased 104 per cent. The company is making large additions to its South Milwaukee works. Within the last three months the new manufacturing unit at Evansville, Ind., began operations and is now running at capacity. The directors were re-elected, and John H. Tweedy, Jr., of Milwaukee, was elected to fill a vacancy on the board.



A New and Improved Design of Machine for Producing Spur Gears by Rolling in Which Hand Feed Has Been Replaced by Power and the Number of Gears of the Machine Reduced

Metal Schedule of the Underwood Tariff

Ore, Rails, Cotton Ties, Fence Wire and
Nails Go on the Free List—Machine Tools
15 Per Cent.—General Reduction 50 Per Cent.

With the convening of the Sixty-third Congress in its first session at Washington, Monday, April 7, the Underwood tariff bill, as prepared by the House Ways and Means Committee, was made public. Below is given the full text of "Schedule C—Metals and Manufactures of," together with various administrative features of the new bill. A comparison is made with the rates under the existing Payne tariff, the latter being inserted in brackets []. As the new duties are practically all ad valorem, the ad valorem equivalents of the present duties are also inserted in parentheses (), the computation being based on the iron and steel importations of 1911 and the duties paid thereon. It will be seen that where the products are still dutiable the policy of the Underwood committee has been to cut the duties down about 50 per cent.

Dutiable List

106. Iron in pigs, iron kentledge, spiegeleisen [\$2.50 per ton], wrought and cast scrap iron and scrap steel [\$1 per ton], 8 per cent. ad valorem (pig iron, 15.66 per cent., spiegeleisen, 13.12 per cent., and scrap, 8.72 per cent. in 1911); but nothing shall be deemed scrap iron or scrap steel except second-hand or waste or refuse iron or steel fit only to be remanufactured; ferromanganese [\$2.50 per ton], chrome or chromium metal, ferrochrome or ferrochromium, ferromolybdenum, ferrophosphorus, ferrotitanium, ferrotungsten, ferrovandium, molybdenum, titanium, tantalum, tungsten or wolfram metal, and ferrosilicon [20 to 25 per cent., according to value], 15 per cent. ad valorem. (Ferromanganese 6.52 per cent., ferrosilicon 20.20 per cent., chrome, etc., 20.69 per cent. in 1911.)

107. All iron in slabs, blooms, loops, or other forms less finished than iron in bars, and more advanced than pig iron, except castings [14/10c. per lb.]; muck bars, bar iron, square iron, rolled or hammered [3/10c. per lb.], round iron, in coils or rods, bars or shapes of rolled or hammered iron not specially provided for in this section [6/10c. per lb.], 8 per cent. ad valorem. (Slabs 25.62 per cent., bar iron 13.80 per cent., round iron 34.03 per cent., charcoal bars and blooms 19.17 per cent. in 1911.)

108. Beams, girders, joists, angles, channels, cartruck channels, T's, columns and posts or parts or sections of columns and posts, deck and bulb beams, sashes, frames, and building forms, together with all other structural shapes of iron or steel, whether plain, punched or fitted for use, or whether assembled or manufactured, 12 per cent. ad valorem. [Not assembled, 3/10c. to 4/10c., according to value; assembled, 45 per cent.] (Imports in 1911, not assembled, 30.56 per cent.)

109. Boiler or other plate iron or steel, and strips of iron or steel, not specially provided for in this section [3/10c. to 6/10c. per lb., according to value]; sheets of iron or steel, common or black, of whatever dimensions, whether plain, corrugated or crimped, including crucible plate steel and saw plates, cut or sheared to shape or otherwise, or unsheared, and skelp iron or steel [5/10c. to 8/10c. per lb.] whether sheared or rolled in grooves, or otherwise, 15 per cent. ad valorem. (Plates 37.68 per cent., common sheets 32.35 per cent., cold rolled sheets 30.03 per cent., saw plates 23.17 per cent. in 1911.)

110. Iron or steel anchors, or parts thereof [1c. per lb.]; forgings of iron or steel, or of combined iron and steel, but not machined, tooled, or otherwise advanced in condition by any process or operation subsequent to the forging process, not specially provided for in this section [30 per cent.], 15 per cent. ad valorem; anti-friction balls, ball bearings, and roller bearings, of iron or steel or other metal, finished or unfinished [45 per cent.], 35 per cent. ad valorem. (Anchors 39.91 per cent., forgings 30 per cent. in 1911.)

111. Hoop, band, or scroll iron or steel not otherwise provided for in this section [3/10c. to 6/10c. per lb.], 12 per cent. ad valorem. (Hoop iron 17.83 per cent., band iron 35 per cent. in 1911.)

112. Railway fishplates or splice bars made of iron or steel [3/10c. per lb.], 10 per cent. ad valorem. (19.94 per cent. in 1911.)

113. All iron or steel sheets, plates, or strips, and all hoop, band, or scroll iron or steel, when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals [2/10c. per lb. extra duty]; sheets or plates composed of iron, steel, copper, nickel, or other metal with layers of other metal or metals imposed thereon by forging, hammering, rolling, or welding [40 per cent.]; sheets of iron or steel, polished, planished, or glanced [1 1/4c. per lb.], by whatever name designated, including such as have been pickled or cleaned by acid, or by any other material or process, or which are cold rolled, smoothed only, not polished, and such as are cold hammered, blued, brightened, tempered, or polished by any process to such perfected surface finish or polish better than the grade of cold rolled, smoothed only [2/10c. per lb. extra duty]; and sheets or plates of iron or steel, or taggers iron or steel, coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates,terne plates, and taggers tin [1.2c. per lb.], 20 per cent. ad valorem. (Galvanized sheets 33.82 per cent., sheets plated by forging 40 per cent., polished sheets 22.86 per cent., pickled sheets 24.27 per cent., cold-rolled strips 35.84 per cent., cold-rolled sheets 29.68 per cent., cold-hammered strips and sheets 32.93 per cent., tin andterne plates 37.55 per cent. in 1911.)

114. Steel ingots, cogged ingots, blooms and slabs, die blocks or blanks, billets and bars, and tapered or beveled bars; mill shafting,

pressed, sheared, or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; hammer molds or swaged steel; gun-barrel molds not in bars; all descriptions and shapes of dry sand, loam, or iron molded steel castings, sheets, and plates, if made by the Bessemer, Siemens-Martin, open-hearth, or similar processes, not containing alloys, such as nickel, chromium, tungsten or wolfram, molybdenum, titanium, iridium, uranium, tantalum, boron, and similar alloys, and steel not specially provided for in this section [7/40c. per lb. to 7c. per lb.], 10 per cent. ad valorem; steel ingots, cogged ingots, blooms and slabs, die blocks or blanks; billets and bars and tapered or beveled bars; pressed, sheared, or stamped shapes not advanced in value or condition by any process or operation subsequent to the process of stamping; hammer molds or swaged steel; gun-barrel molds not in bars; alloys used as substitutes for steel in the manufacture of tools; all descriptions and shapes of dry sand, loam, or iron molded castings, sheets, and plates; rolled wire rods in coils or bars not smaller than number six wire gauge, and steel not specially provided for in this section, all the foregoing when made by the crucible, electric, or cementation process, either with or without alloys, and finished by rolling, hammering, or otherwise [Most of above carried duty of 7/40c. to 7c. per lb., according to value, and 20 per cent. on value above 40c. per lb.], 15 per cent. ad valorem.

115. Steel wool or steel shavings [40 per cent.], 20 per cent. ad valorem.

116. Grit, shot, and sand made of iron or steel, that can be used as abrasives [1c. per lb.], 30 per centum ad valorem. (72.91 per cent. in 1911.)

117. Rivet, screw, fence, nail, and other iron or steel wire rods, whether round, oval, or square, or in any other shape, and flat rods up to six inches in width ready to be drawn or rolled into wire, all the foregoing in coils or otherwise, including wire rods and iron or steel bars, cold rolled, cold drawn, cold hammered, or polished in any way in addition to the ordinary process of hot rolling or hammering [1 1/4c. per lb. extra duty], 10 per cent. ad valorem: Provided, That all round iron or steel rods smaller than number six wire gauge shall be classed and dutiable as wire. (Plain rods 14.12 per cent., cold rolled, etc., 14.91 per cent. in 1911.)

118. Round iron or steel wire; wire composed of iron, steel, or other metal [1c. to 1 1/4c. per lb.], except gold or silver, covered with cotton, silk, or other material; corset clasps, corset steels, dress steels and all flat wires and steel in strips not thicker than No. 15 wire gauge and not exceeding 5 in. in width, whether in long or short lengths, in coils or otherwise, and whether rolled or drawn through dies or rolls, or otherwise produced [35 per cent.]; telegraph, telephone, and other wires and cables composed of metal and rubber, or of metal, rubber, and other materials [40 per cent.]; iron and steel wire coated by dipping, galvanizing, or similar process with zinc, tin, or other metal [2/10c. per lb. extra duty]; all other wire not specially provided for in this section [35 per cent.] and articles manufactured wholly or in chief value of any wire or wires provided for in this section [1c. per lb. extra], all the foregoing 20 per cent. ad valorem; wire heddles and healds [25c. per 1000 and 40 per cent. extra duty], 25 per cent. ad valorem; wire rope [maximum wire duty and 1c. per lb.], 30 per cent. ad valorem. (Plain wire 38.18 per cent., covered with silk, etc., 35 per cent., cold hammered 37.07 per cent., coated 37.23 per cent., manufacturers of wire 44.56 per cent., heddles 77.72 per cent. in 1911.)

119. No article not specially provided for in this section, which is wholly or partly manufactured from tin plate,terne plate, or the sheet, plate, hoop, band, or scroll iron or steel herein provided for, or of which such tin plate,terne plate, sheet, plate, hoop, band, or scroll iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate,terne plate, or sheet, plate, hoop, band, or scroll iron or steel from which it is made, or of which it shall be the component thereof of chief value.

120. No allowance or reduction of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron or steel, or upon any article wholly or partly manufactured of iron or steel, or upon any manufacture of iron or steel.

121. All metal produced from iron or its ores, which is cast and malleable, of whatever description or form, without regard to the percentage of carbon contained therein, whether produced by cementation, or converted, cast, or made from iron or its ores, by the crucible, Bessemer, Clapp-Griffith, pneumatic, Thomas-Gil-

christ, basic, Siemens-Martin, or open-hearth process, or by the equivalent of either, or by a combination of two or more of the processes, or their equivalents, or by any fusion or other process which produces from iron or its ores a metal either granular or fibrous in structure, which is cast and malleable, excepting what is known as malleable-iron castings, shall be classed and denominated as steel.

122. Anvils of iron or steel, or of iron and steel combined, by whatever process made, or in whatever stage of manufacture [1½c. per lb.], 15 per cent. ad valorem. (31.95 per cent. in 1911.)

123. Finished automobiles and automobile bodies, 45 per cent. ad valorem; automobile chassis, 30 per cent. ad valorem; finished parts of automobiles, not including tires, 20 per cent. ad valorem. [All the above, 45 per cent.]

124. Bicycles, 25 per cent. ad valorem; motor cycles, and finished parts thereof, not including tires [45 per cent.], 40 per cent. ad valorem.

125. Axles, or parts thereof, axle bars, axle blanks, or forgings for axles, whether of iron or steel, without reference to the stage or state of manufacture, not otherwise provided for in this section [¾c. per lb.], 10 per cent. ad valorem: Provided, That when iron or steel axles are imported fitted in wheels, or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted. (14.81 per cent. in 1911.)

126. Blacksmiths' hammers, tongs, and sledges, track tools, wedges, and crowbars, whether of iron or steel [1¾c. per lb.], 10 per cent. ad valorem. (17.12 in 1911.)

127. Bolts, with or without threads or nuts, or bolt blanks, finished hinges or hinge blanks, nuts, and washers [1½c. per lb.], 15 per cent. ad valorem; spiral nut locks and lock washers, whether of iron or steel [1½c. per lb.], 35 per cent. ad valorem. (29.07 per cent. in 1911.)

128. Card clothing not actually and permanently fitted to and attached to carding machines or to parts thereof at the time of importation, when manufactured with round iron or round steel wire, tempered or untempered, and including that manufactured with plated wire or other than iron or steel wire, or with felt face, wool face, or rubber face cloth containing wool [20c. to 55c. per sq. ft.], 40 per cent. ad valorem. (57.34 per cent. in 1911.)

129. Cast-iron pipe of every description [¾c. per lb.], 12 per cent. ad valorem; cast-iron andirons, plates, stove plates, sadirons, tailors' irons, hatters' irons, and castings and vessels wholly of cast iron [8/10c. per lb.], including all castings of iron or cast-iron plates which have been chiseled, drilled, machined, or otherwise advanced in condition by processes or operations subsequent to the casting process but not made up into articles or finished machine parts [2/10c. per lb. extra duty]; castings of malleable iron not specially provided for in this section [7/10c. per lb.]; cast hollow ware, coated, glazed, or tinned [1½c. per lb.], 10 per cent. ad valorem. (Pipe 16.30 per cent., andirons 11.17 per cent., castings 26.16 per cent., malleable castings 13.80 per cent., hollow ware 20.01 per cent. in 1911.)

130. Chain or chains of all kinds, made of iron or steel [¾c. to 3c. per lb.], 20 per cent. ad valorem. (31.12 per cent. in 1911.)

131. Lap-welded, butt-welded, seamed, or jointed iron or steel tubes, pipes, flues, or stays; cylindrical or tubular tanks or vessels, for holding gas, liquids, or other material, whether full or empty; flexible metal tubing or hose, not specially provided for in this section, whether covered with wire or other material, or otherwise, including any appliances or attachments affixed thereto; welded cylindrical furnaces, tubes or flues made from plate metal, and corrugated, ribbed, or otherwise reinforced against collapsing pressure, and all other iron or steel tubes, finished, not specially provided for in this section [30 per cent.], 20 per cent. ad valorem. (Tubes 29.01 per cent., cylindrical tanks 29.95 per cent., cylindrical furnaces 45.71 per cent. in 1911.)

132. Penknives, pocketknives, clasp knives, pruning knives, budding knives, erasers, manicure knives, and all knives by whatever name known, including such as are denominatively mentioned in this section, which have folding or other than fixed blades or attachments, and razors, all the foregoing, whether assembled but not fully finished or finished [40 per cent. to 20c. each and 40 per cent. extra]; valued at not more than \$1 per dozen, 35 per cent. ad valorem; valued at more than \$1 per dozen, 55 per cent. ad valorem: Provided, That blades, handles, or other parts of any of the foregoing knives, razors, or erasers shall be dutiable at not less than the rate herein imposed upon the knives, razors, and erasers, of which they are parts. Scissors and shears, and blades for the same, finished or unfinished, 30 per cent. ad valorem: Provided further, That all articles specified in this paragraph shall, when imported, have the name of the maker or purchaser and beneath the same the name of the country of origin die-sunk conspicuously and indelibly on the blade, shank, or tang of at least one or, if practicable, each and every blade thereof. (Penknives 77.62 per cent., razors 71.30 per cent., scissors and shears 52.55 per cent. in 1911.)

133. Sword blades, and swords and side arms, irrespective of quality or use, in part of metal [50 per cent.], 30 per cent. ad valorem.

134. Table, butchers', carving, cooks', hunting, kitchen, bread, butter, vegetable, fruit, cheese, carpenters' bench, curriers', drawing, farriers', fleshing, hay, tanners', plumbers', painters', palette, artists', and shoe knives, forks and steels, finished or unfinished, without handles [not under 40 per cent.], 25 per cent. ad valorem; with handles, 30 per cent. ad valorem: Provided, That all the articles specified in this paragraph, when imported, shall have the name of the maker or purchaser, and beneath the same the name of the country of origin indelibly stamped or branded thereon in a place that shall not be covered thereafter.

135. Files, file blanks, rasps, and floats, of all cuts and kinds

[25c. to 77½c. per dozen], 25 per cent. ad valorem. (In 1911 61.16 per cent.)

136. Muskets, air-rifles, muzzle-loading shotguns, and rifles, and parts thereof [25 per cent.], 15 per cent. ad valorem.

137. Breech-loading shotguns and rifles, combination shotguns and rifles, and parts thereof and fittings therefor, including barrels further advanced than rough bored only; pistols, whether automatic, magazine, or revolving, or parts thereof and fittings therefor [75c. each and 25 per cent. extra to \$6 each and 35 per cent. extra], 35 per cent. ad valorem. (In 1911, 45.64 per cent.)

138. Table, kitchen, and hospital utensils, or other similar hollow ware of aluminum or of iron or steel, enameled or glazed with vitreous glasses, but not ornamented or decorated with lithographic or other printing [40 per cent.], 25 per cent. ad valorem.

139. Needles for knitting or sewing machines [\$1 per 1000 and 25 per cent. extra], latch needles [\$1.15 per 1000 and 35 per cent. extra], crochet needles, and tape needles, knitting and all other needles not specially provided for in this section, bodkins of metal, and needle cases or needle books furnished with assortments of needle or combinations of needles and other articles [25 per cent.], 25 per cent. ad valorem; but no articles other than the needles which are specifically named in this section shall be dutiable as needles unless having an eye and fitted and used for carrying a thread. (In 1911, 42.98 per cent.)

140. Fishhooks, fishing rods and reels, artificial flies, artificial baits, snelled hooks, and all other fishing tackle or parts thereof, not specially provided for in this section, except fishing lines, fishing nets and seines [45 per cent.], 30 per cent. ad valorem.

141. Steel plates engraved, stereotype plates, electrotype plates, and plates of other materials, engraved for printing [20 per cent.], plates of iron or steel engraved or fashioned for use in the production of designs, patterns, or impressions on glass in the process of manufacturing plate or other glass [25 per cent.], 15 per cent. ad valorem; lithographic plates of stone or other material engraved, drawn, or prepared, and wet transfer paper or paper prepared wholly with glycerin, or glycerin combined with other materials, containing the imprints taken from lithographic plates [50 per cent.], 25 per cent. ad valorem.

142. Rivets, studs, and steel points, lathed, machined, or brightened, and rivets or studs for non-skidding automobile tires [45 per cent.], and rivets of iron or steel, not specially provided for in this section [1¼c. per lb.], 20 per cent. ad valorem. (In 1911, 39.76 per cent.)

143. Crosscut saws, mill saws, pit and drag saws, circular saws, steel band saws, finished or further advanced than tempered and polished, hand, back, and all other saws, not specially provided for in this section [5c. per linear ft. to 5c. per lb. and 20 per cent. extra], 12 per cent. ad valorem. (Crosscut saws 17.35 per cent., pit and drag saws 31.44 per cent., circular saws 20 per cent., band saws 30.26 per cent., hand and back saws 25 per cent. in 1911.)

144. Screws, commonly called wood screws, made of iron or steel [3 to 10c. per lb.], 25 per cent. ad valorem. (In 1911, 54.23 per cent.)

145. Umbrella and parasol ribs and stretchers, composed in chief value of iron, steel, or other metal, in frames or otherwise, and tubes for umbrellas, wholly or partially finished [50 per cent.], 35 per cent. ad valorem.

146. Wheels for railway purposes, or parts thereof, made of iron or steel, and steel-tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car, or other railway tires or parts thereof, wholly or partly manufactured [1¼c. per lb.], 25 per cent. ad valorem (50.63 per cent. in 1911); ingots, cogged ingots, blooms, or blanks for the same, without regard to the degree of manufacture [1c. per lb.], 10 per cent. ad valorem (14 per cent. in 1911): Provided, That when wheels for railway purposes, or parts thereof, of iron or steel, are imported with iron or steel axles fitted in them, the wheels and axles together shall be dutiable at the same rate as is provided for the wheels when imported separately. (Total paragraph, 50.63 per cent. in 1911.)

147. Aluminum, aluminum scrap, and alloys of any kind in which aluminum is the component material of chief value, in crude form [7c. per lb.], aluminum in plates, sheets, bars, and rods [11c. per lb.]; barium, calcium, magnesium, sodium, and potassium, and alloys of which said metals are the component material of chief value [3c. per lb. and 25 per cent.], 25 per cent. ad valorem. (In 1911, 46.19 per cent.)

148. Antimony, as regulus or metal [1¼c. per lb.] (26 per cent. in 1911), antimony ore, stibnite and matte containing antimony but not containing more than 10 per cent. of lead [1c. per lb.] (26.98 per cent. in 1911), 10 per cent. ad valorem: Provided, That on all importations of antimony-bearing ores and matte containing antimony the duties shall be estimated at the port of entry, and a bond given in double the amount of such estimated duties for the transportation of the ores by common carriers bonded for the transportation of appraised or unappraised merchandise to properly equipped sampling or smelting establishments, whether designated as bonded warehouses or otherwise. On the arrival of the ores at such establishments, they shall be sampled according to commercial methods under the supervision of Government officers, who shall be stationed at such establishments, and who shall submit the samples thus obtained to a Government assayer, designated by the Secretary of the Treasury, who shall make a proper assay of the sample and report the result to the proper customs officers, and the import entry shall be liquidated thereon, except in case of ores that shall be removed to a bonded warehouse to be refined for exportation as provided by law, and the Secretary of the Treasury is authorized to make all necessary regulations to enforce the provisions of this paragraph; antimony, oxide of [1½c. per lb. and 25 per cent.] (53.07 per cent. in 1911), 25 per cent. ad valorem.

149. Argentine, albatra, or German silver, unmanufactured [25 per cent.], 15 per cent. ad valorem.

150. Bronze powder [12c. per lb.] (57.33 per cent. in 1911), brocades, flitters, and metallics; bronze, or Dutch-metal or aluminum, in leaf [6c. per 100 leaves] (41.06 per cent. in 1911), 25 per cent. ad valorem.

151. Copper, in rolled plates, called braziers' copper, sheets, rods, pipes, and copper bottoms [2½c. per lb.] (11.48 per cent. in 1911), sheathing or yellow metal of which copper is the component material of chief value, and not composed wholly or in part of iron ungalvanized [2c. per lb.] (10.97 per cent. in 1911), 5 per cent. ad valorem.

152. Gold leaf [35c. per 100 leaves upward] (38.65 per cent. in 1911), 35 per cent. ad valorem.

153. Silver leaf [10c. per 100 leaves] (87.70 per cent. in 1911), 30 per cent. ad valorem.

154. Tinsel wire, lame or lahm, made wholly or in chief value of gold, silver, or other metal [5c. per lb.] (10.45 per cent. in 1911), 10 per cent. ad valorem; bullions and metal threads, made wholly or in chief value of tinsel wire, lame or lahm [5c. per lb. and 30 per cent.] (35.20 per cent. in 1911), 30 per cent. ad valorem; fabrics, ribbons, beltings, toys, or other articles, made wholly or in chief value of tinsel wire, lame or lahm, bullions, or metal threads [15c. per lb. and 60 per cent.] (63.76 per cent. in 1911), 40 per cent. ad valorem.

155. Hooks and eyes, metallic, snap fasteners and clasps by whatever name known, trousers buckles and waistcoat buckles made wholly or partly of iron or steel, steel trousers buttons and metal buttons not specially provided for in this section, all the foregoing and parts thereof [4½c. per lb. and 15 per cent.] (32.61 per cent. in 1911), 15 per cent. ad valorem.

156. Lead-bearing ores of all kinds [1½c. per lb.] ¼c. per lb. on the lead contained therein: Provided, That on all importations of lead-bearing ores the duties shall be estimated at the port of entry, and a bond given in double the amount of such estimated duties for the transportation of the ores by common carriers bonded for the transportation of appraised or unappraised merchandise to properly equipped sampling or smelting establishments, whether designated as bonded warehouses or otherwise. On the arrival of the ores at such establishments they shall be sampled according to commercial methods under the supervision of Government officers, who shall be stationed at such establishments, and who shall submit the samples thus obtained to a Government assayer, designated by the Secretary of the Treasury, who shall make a proper assay of the sample and report the result to the proper customs officers, and the import entries shall be liquidated thereon, except in case of ores that shall be removed to a bonded warehouse to be refined for exportation as provided by law. And the Secretary of the Treasury is authorized to make all necessary regulations to enforce the provisions of this paragraph.

157. Lead dross [1½c. per lb.] (52.77 per cent. in 1911), lead bullion or base bullion, lead in pigs and bars, lead in any form not specially provided for in this section, old refuse, lead run into blocks and bars, and old scrap fit only to be remanufactured [2½c. per lb.] (93.59 per cent. in 1911); lead in sheets, pipe, shot, glaziers' lead, and lead wire [2½c. per lb.] (52.75 per cent. in 1911); all the foregoing, 25 per cent. ad valorem.

158. Metallic mineral substances in a crude state, and metals unwrought, whether capable or being wrought or not, not specially provided for in this section [20 per cent.], 10 per cent. ad valorem; monazite sand and thorite [4c. per lb.] (44.82 per cent. in 1911); thorium, oxide of and salts of; gas mantles treated with chemicals or metallic oxides [40 per cent.], 25 per cent. ad valorem; and gas-mantle scrap consisting in chief value of metallic oxides [40 per cent.], 10 per cent. ad valorem.

159. Nickel, nickel oxide, alloy of any kind in which nickel is a component material of chief value, in pigs, ingots, bars, rods, or plates [6c. per lb.] (16.80 per cent. in 1911), 10 per cent. ad valorem; sheets or strips [35 per cent.], 20 per cent. ad valorem.

160. Pens, metallic [except gold, 12c. per gross], 8c. per gross; with nib and barrel in one piece [15c. per gross], 12c. per gross.

161. Penholder tips, penholders and parts thereof [5c. per gross and 25 per cent.] (28.95 per cent. in 1911), gold pens [25 per cent.], fountain pens and stylographic pens [30 per cent.]; combination penholders, comprising penholder, pencil, rubber eraser, automatic stamp, or other attachment [45 per cent.], 25 per cent. ad valorem.

162. Pins with solid heads, without ornamentation, including hair, safety, hat, bonnet, and shawl pins; any of the foregoing composed wholly of brass, copper, iron, steel, or other base metal, not plated with gold or silver, and not commonly known as jewelry [35 per cent.], 20 per cent. ad valorem.

163. Quicksilver [7c. per lb.] (13.24 per cent. in 1911), 10 per cent. ad valorem. The flasks, bottles, or other vessels in which quicksilver is imported shall be subject to the same rate of duty as they would be subjected to if imported empty.

164. Type metal, on the lead contained therein [1½c. per lb.] (33.54 per cent. in 1911), and new types [25 per cent.], 15 per cent. ad valorem.

165. Watch movements, including time-detectors, whether imported in cases or not [75c. each up to \$3 and 25 per cent. each] (51.84 per cent. in 1911), watch cases and parts of watches, chronometers, box or ship, and parts thereof [40 per cent.], lever clock movements having jewels in the escapement, and clocks containing such movements [1 each and 40 per cent.] (53.20 per cent. in 1911), all other clocks and parts thereof, not otherwise provided for in this section, whether separately packed or otherwise, not composed wholly or in chief value of china, porcelain, parian, bisque, or earthenware [40 per cent.], 30 per cent. ad valorem; all jewels for use in the manufacture of watches or clocks [10 per cent.], 10 per cent. ad valorem; enameled dials and dial plates for watches or other instruments [3c. each and 40 per cent.] (98.16 per cent. in 1911), 30 per cent. ad valorem: Provided, That all watch and clock dials, whether attached to movements or not shall have indelibly painted or

printed thereon the name of the country of origin, and that all watch movements, and plates, lever clock movements with jewels in the escapement, whether imported assembled or knocked down for reassembling, and cases of foreign manufacture, shall have the name of the manufacturer and country of manufacture cut, engraved, or die-sunk conspicuously and indelibly on the plate of the movement and the inside of the case, respectively, and the movements and plates shall also have marked thereon by one of the methods indicated the number of jewels and adjustments, said numbers to be expressed either in words or in Arabic numerals; and if the movement is not adjusted, the word "unadjusted" shall be marked thereon by one of the methods indicated; and none of the aforesaid articles shall be delivered to the importer unless marked in exact conformity to this direction.

166. Zinc-bearing ores of all kinds, including calamine [free is less than 10 per cent. zinc and graduated up to 1c. per lb.] (55.64 per cent. in 1911), 10 per cent. ad valorem.

167. Zinc in blocks, pigs, or sheets, and zinc dust [1½c. to 1½c. per lb.] (28.57 per cent. in 1911); and old and worn-out zinc fit only to be remanufactured [1c. per lb.] (25.60 per cent. in 1911), 10 per cent. ad valorem.

168. Bottle caps, collapsible tubes, and sprinkler tops, if not decorated, colored, waxed, lacquered, enameled, lithographed, electroplated, or embossed in color [½c. per lb.] (54.88 per cent. in 1911), 30 per cent. ad valorem; if decorated, colored, waxed, lacquered, enameled, lithographed, electroplated, or embossed in color, 40 per cent. ad valorem.

169. All steam engines [30 per cent.], steam locomotives [45 per cent.], printing presses and machine tools [30 per cent.], 15 per cent. ad valorem; embroidering machines, and lace-making machines, including machines for making lace curtains, nets, or nettings [45 per cent.], 25 per cent. ad valorem; machine tools as used in this paragraph shall be held to mean any machine operated by other than hand power which employs a tool for working on metal.

170. Nippers and pliers of all kinds wholly or partly manufactured [8c. per lb. and 40 per cent.] (59.74 per cent. in 1911), 30 per cent. ad valorem.

171. Articles or wares not specially provided for in this section; if composed wholly or in part of platinum, gold, or silver, and articles or wares plated with gold or silver, and whether partly or wholly manufactured [45 per cent.], 50 per cent. ad valorem; if composed wholly or in chief value of iron, steel, lead, copper, nickel, pewter, zinc, aluminum, or other metal, and whether partly or wholly manufactured [45 per cent.], 25 per cent. ad valorem.

Free List

[When not otherwise indicated, the articles are now on free list.]

406. Agricultural implements: Plows, tooth and disk harrows, headers, harvesters, reapers, agricultural drills and planters, mowers, horserakes, cultivators, thrashing machines and cotton gins, wagons and carts, and all other agricultural implements of any kind and description [15 per cent., but free from any country imposing no duty], whether specifically mentioned herein or not, whether in whole or in parts, including repair parts.

424. Bauxite or beauxite, crude [\$1 per ton], not refined or otherwise advanced in condition from its natural state.

426. Bells, broken, and bell metal, broken and fit only to be remanufactured.

428. All binding twine manufactured from New Zealand hemp, manila, istle or Tampico fiber, sisal grass, or sunn, or a mixture of any two or more of them, of single ply and measuring not exceeding 600 ft. to the pound.

434. Blue vitriol, or sulphate of copper [½c. per lb.]; acetate and subacetate of copper, or verdigris [25 per cent.].

444. Brass, old brass, clippings from brass or Dutch metal, all the foregoing, fit only for remanufacture.

450. Bullion, gold or silver.

455. Cash registers, linotype and all typesetting machines, sewing machines, typewriters, and tar and oil spreading machines used in the construction and maintenance of roads and in improving them by the use of road preservatives, all the foregoing whether imported in whole or in parts, including repair parts [30 per cent.].

460. Charcoal [20 per cent.], blood char, bone char, or bone black, not suitable for use as a pigment.

461. Chromate of iron or chromic ore.

464. Coal, anthracite [free], bituminous, culm, slack, and shale [45 per cent.]; coke [20 per cent.]; compositions used for fuel in which coal or coal dust is the component material of chief value, whether in briquets or other form [20 per cent.].

465. Coal tar, crude, pitch of coal tar, wood or other tar, and products of coal tar known as naphthalene, phenol, and cresol.

473. Composition metal of which copper is the component material of chief value, not specially provided for in this section.

474. Copper ore; regulus of, and black or coarse copper, and copper cement; old copper, fit only for remanufacture, clippings from new copper, and copper in plates, bars, ingots, or pigs, not manufactured or specially provided for in this section.

475. Copperas [15-100 c. per lb.], or sulphate of iron.

483. Curling stones, or quoits, and curling-stone handles.

491. Emery ore and corundum.

516. Hones and whetstones.

518. Hoop or band iron, or hoop or band steel, cut to lengths, or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation, with or without buckles or fastenings, for haling cotton or any other commodity [3/10c. per lb.].

526. Iron ore, including manganiferous iron ore, and the dross or residuum from burnt pyrites [15c. per ton].

530. Junk, old.

546. Magnesite, crude, not purified.

547. Manganese, oxide and ore of.
557. Minerals, crude, or not advanced in value or condition by refining or grinding, or by other process of manufacture, not specially provided for in this section.
558. Miners' rescue appliances, designed for emergency use in mines where artificial breathing is necessary in the presence of poisonous gases, to aid in the saving of human life, and miners' safety lamps.
559. Models of inventions and of other improvements in the arts, to be used exclusively as models and incapable of any other use.
562. Cut nails and cut spikes of iron or steel [4/10c. per lb.], horseshoe nails, hobnails [1½c. per lb.], and all other wrought-iron or steel nails not specially provided for in this section [1½c. per lb.]; wire staples [not less than 40 per cent.], wire nails made of wrought iron or steel [4/10 to 1c. per lb.], spikes [4/10 to ¾c. per lb.], and horse, mule, or ox shoes, of wrought iron or steel [¾c. per lb.], and cut tacks, brads, or sprigs [¾c. per 1000 to ¾c. per lb.].
563. Needles, hand sewing and darning.
580. Pewter and britannia metal, old, and fit only to be remanufactured.
585. Platinum, unmanufactured or in ingots, bars, plates, sheets, wire, sponge, or scrap, and vases, retorts, and other apparatus, vessels, and parts thereof, composed of platinum, for chemical uses.
586. Plumbago.
593. Rags, not otherwise specially provided for in this section.
594. Railway bars, made of iron or steel, and railway bars made in part of steel, T rails, and punched iron or steel flat rails [7-40c. per lb.].
604. Shotgun barrels, in single tubes, forged, rough bored.
635. Tin ore, cassiterite or black oxide of tin, tin in bars, blocks, pigs, or grain or granulated, and scrap tin: Provided, that there shall be imposed and paid upon cassiterite, or black oxide of tin, and upon bar, block, pig tin and grain or granulated, a duty of 4c. per lb. when it is made to appear to the satisfaction of the President of the United States that the mines of the United States are producing 1500 tons of cassiterite and bar, block, and pig tin per year. The President shall make known this fact by proclamation, and thereafter said duties shall go into effect.
637. Tungsten-bearing ores of all kinds [10 per cent.].
641. Types, old, and fit only to be remanufactured.
649. Barbed wire [¾c. per lb.], galvanized wire not larger than No. 6 and not smaller than No. 14 wire gauge of the kind commonly used for fencing purposes [2c. per lb.], galvanized wire fencing composed of wires not larger than No. 6 nor smaller than No. 14 wire gauge, and wire commonly used for baling hay or other commodities [not less than 40 per cent.].

Special Provisions of Trade Interest

Section IV.

A. That for the purpose of readjusting the present duties on importations into the United States and at the same time to encourage the export trade of this country, the President of the United States is authorized and empowered to negotiate trade agreements with foreign nations wherein mutual concessions are made looking toward freer trade relations and further reciprocal expansion of trade and commerce: Provided, however, that said trade agreements before becoming operative shall be submitted to the Congress of the United States for ratification or rejection.

B. That nothing in this act contained shall be so construed as to abrogate or in any manner impair or affect the provisions of the treaty of commercial reciprocity concluded between the United States and the Republic of Cuba December 11, 1902, or the provisions of the act of Congress heretofore passed for the execution of the same.

C. That there shall be levied, collected, and paid upon all articles coming into the United States from the Philippine Islands the rates of duty which are required to be levied, collected and paid upon like articles imported from foreign countries.

D. That articles, goods, wares, or merchandise going into Porto Rico from the United States shall be exempted from the payment of any tax imposed by the internal-revenue laws of the United States.

E. That whenever any country, dependency, colony, province, or other political subdivision of government shall pay or bestow, directly or indirectly, any bounty or grant upon the exportation of any article or merchandise from such country, dependency, colony, province, or other political subdivision of government, and such article or merchandise is dutiable under the provisions of this act, then upon the importation of any such article or merchandise into the United States, whether the same shall be imported directly from the country of production or otherwise, and whether such article or merchandise is imported in the same condition as when exported from the country of production or has been changed in condition by remanufacture or otherwise, there shall be levied and paid, in all such cases, in addition to the duties otherwise imposed by this act, an additional duty equal to the net amount of such bounty or grant, however the same be paid or bestowed. The net amount of all such bounties or grants shall be from time to time ascertained, determined, and declared by the Secretary of the Treasury, who shall make all needful regulations for the identification of such articles and merchandise and for the assessment and collection of such additional duties.

F. That all articles of foreign manufacture or production, which are capable of being marked, stamped, branded, or labeled, without injury, shall be marked, stamped, branded, or labeled in legible English words, in a conspicuous place that shall not be covered or obscured by any subsequent attachments or arrangements, so as to indicate the country of origin.

That all goods, wares, articles, and merchandise manufactured wholly or in part in any foreign country by convict labor shall not be entitled to entry at any of the ports of the United States, and the importation thereof is hereby prohibited, and the Secretary of the Treasury is authorized and directed to prescribe such regulations as may be necessary for the enforcement of this provision.

That a discriminating duty of 10 per cent. ad valorem, in addition to the duties imposed by law, shall be levied, collected, and paid on all goods, wares, or merchandise which shall be imported in vessels not of the United States, or which being the production or manufacture of any foreign country not contiguous to the United States, shall come into the United States from such contiguous country; but this discriminating duty shall not apply to goods, wares, or merchandise which shall be imported in vessels not of the United States entitled at the time of such importation by treaty or convention or act of Congress to be entered in the ports of the United States on payment of the same duties as shall then be payable on goods, wares, and merchandise imported in vessels of the United States, nor to such foreign products or manufactures as shall be imported from such contiguous countries in the usual course of strictly retail trade.

That machinery or other articles to be altered or repaired, commercial travelers' samples solely for use in taking orders for merchandise, articles intended solely for experimental purposes, and automobiles, motor cycles, bicycles, aeroplanes, airships, balloons, motor boats, racing shells, teams, and saddle horses, and similar vehicles and craft brought temporarily into the United States by nonresidents for touring purposes or for the purpose of taking part in races or other specific contests, may be admitted without the payment of duty under bond for the exportation within six months from the date of importation and under such regulations and subject to such conditions as the Secretary of the Treasury may prescribe: Provided, that no article shall be entitled to entry under this section that is intended for sale or which is imported for sale on approval.

That all materials of foreign production which may be necessary for the construction of vessels built in the United States for foreign account and ownership, or for the purpose of being employed in the foreign or domestic trade, and all such materials necessary for the building of their machinery, and all articles necessary for their outfit and equipment, may be imported in bond under such regulations as the Secretary of the Treasury may prescribe; and upon proof that such materials have been used for such purposes no duties shall be paid thereon.

That all articles of foreign production needed for the repair of American vessels may be withdrawn from bonded warehouses free of duty, under such regulations as the Secretary of the Treasury may prescribe.

That a discount of 5 per cent. on all duties imposed by this act shall be allowed on such goods, wares, and merchandise as shall be imported in vessels built in the United States, and which shall be wholly the property of a citizen or citizens thereof.

The privilege of purchasing supplies from public warehouses, free of duty, and from bonded manufacturing warehouses, free of duty or of internal-revenue tax, as the case may be, shall be extended, under such regulations as the Secretary of the Treasury shall prescribe, to the vessels of war of any nation in ports of the United States which may reciprocate such privileges toward the vessels of war of the United States in its ports.

That whenever any vessel laden with merchandise, in whole or in part subject to duty, has been sunk in any river, harbor, bay, or waters subject to the jurisdiction of the United States, and within its limits, for the period of two years, and is abandoned by the owner thereof, any person who may raise such vessel shall be permitted to bring any merchandise recovered therefrom into the port nearest to the place where such vessel was so raised free from the payment of any duty thereupon, but under such regulations as the Secretary of the Treasury may prescribe.

That upon the exportation of articles manufactured or produced in the United States by the use of imported merchandise or materials upon which customs duties have been paid, the full amount of such duties paid upon the quantity of materials used in the manufacture or production of the exported product shall be refunded as drawback, less 1 per cent. of such duties.

That whenever articles are exported to the United States of a class or kind made or produced in the United States, if the export or actual selling price to an importer in the United States, or the price at which such goods are consigned is less than the fair market value of the same article when sold for home consumption in the usual and ordinary course in the country whence exported to the United States at the time of its exportation to the United States, there shall, in addition to the duties otherwise established, be levied, collected, and paid on such article on its importation into the United States a special duty (or dumping duty) equal to the difference between the said export or actual selling price of the article for export or the price at which such goods are consigned, and the said fair market value thereof for home consumption, provided that the said special duty shall not exceed 15 per cent. ad valorem in any case and that goods whereon the duties otherwise established are equal to 50 per cent. ad valorem shall be exempt from such special duty.

"Export price" or "selling price" or "price at which such goods are consigned" in this section shall be held to mean and include the exporter's price for the goods, exclusive of all charges thereon after their shipment from the place whence exported directly to the United States.

The Secretary of the Treasury shall make such rules and regulations as are necessary for the carrying out of the provisions of this section and the enforcement thereof.

New York State Steel Company Receivership

As mentioned briefly last week, the New York State Steel Company, Buffalo, has been placed in the hands of receivers. Judge John R. Hazel, of the United States District Court, on April 3 appointed F. Ernest Porter, a director of the company and superintendent of its plant, and Alfred L. Becker, of the United States Fidelity & Guaranty Company, to act in such capacity. The appointments were made on the application of the J. H. Hilman & Sons Company, Pittsburgh, which had instituted suit to recover for a quantity of coke, stating that the company had large indebtedness and was unable to meet its maturing notes. Several other suits are pending, but Judge Hazel's order prohibits all creditors from pressing such proceedings and directs the receivers to conduct the business of the company and continue the operations of its plant and mines and make periodical reports to the court.

At a meeting of the stockholders held March 13, plans for the reorganization and development of the company were formulated and additional money was placed in the treasury to continue the full operation of the plant.

Shortly after this meeting, however, Frederick Davidson, who had at that time been elected president, was taken seriously ill at Philadelphia and on that account it was found impossible, for the time being at least, to continue the plans which he had inaugurated. On his recovery it is expected that plans will be put in effect which will enable the company to eventually work out from under its financial difficulties and for that reason it is hoped that the régime of the receivership will be of brief duration.

The receivers are arranging to continue the operation of the four mines belonging to the company on the Mesaba Range, known as the Kellogg, Larkin, Knox and Roberts, from which ore will be brought down next summer for the operation of the furnaces. There is sufficient ore on hand at the plant for present needs and for the near future. The completion of lift bridges, on which work is now under way, for the Lake Shore, Nickel Plate and Lackawanna railroads over the Buffalo River below the New York State Steel Company's plant and the deepening of the river channel to a depth of 23 ft., to be completed the coming fall, will enable ore carriers to discharge their cargoes directly at the plant, which is impossible at present, and thus reduce the cost of ore transportation.

Foundrymen's Meetings

At the monthly meeting of the Newark Foundrymen's Association, Newark, N. J., April 3, R. G. Williams, Norton Company, Worcester, Mass., delivered an illustrated lecture on "Abrasive Materials—Their Manufacture and Use." The views were unusually complete and interesting in portraying manufacture from the mining of bauxite through the various processes to the completion, grading and testing of Alundum and Crystolon grinding wheels, the former for steel and the latter for cast iron. The speaker's pleasing delivery and the ready facility with which he answered questions were most favorably commented on by the members when he received the thanks of the association.

A business session followed the lecture. Secretary A. E. Barlow reported briefly on the efforts of the association in connection with legislation at Trenton. Incidentally he referred to the increasing number of inquiries which were being received relative to the association and its activities. As the annual meeting and election of officers takes place at the May meeting, nominations were considered and the present officers renominated, as follows: G. Hanny, Oscar Barnett Foundry Company, Irvington, N. J., for president; James Flockhart, Maher & Flockhart, Newark, vice-president; Arthur E. Barlow, Barlow Foundry Company, Newark, secretary; John Campbell, Maher & Flockhart, treasurer, and the following executive committee: James Flockhart, Louis Sacks, Thomas Malcolm, James Morrison and R. J. M. Welch. Dinner was served before the meeting.

The Philadelphia Foundrymen's Association held its regular monthly meeting at the Hotel Walton, in that city, on the evening of April 2, Thomas Devlin presiding. A paper was read on "The Disposal and Purification of Factory Sewage and Wastes," by Charles A. Blatchley, consulting engineer, Philadelphia, illustrated by numerous

lattern slides. The paper was of considerable interest, as the matter of polluting streams by drainage of sewage and factory wastes has been given material attention by the health boards of New York, New Jersey, Pennsylvania, Delaware and other States.

At the monthly meeting of the Chicago Foundrymen's Club, to be held Saturday evening, April 12, at the Great Northern Hotel, the subject of "Foundry Floor Space Requirements per Ton of Yearly Output" will be considered. An introductory paper by O. J. Abell, of *The Iron Age*, is to be followed by discussions of the topic as applied to various classes of foundry work. E. W. Smith, Crane Company, will discuss the space designing of the light work foundry; A. M. Thompson, F. C. Caldwell & Co., the floor requirements of heavier castings, and A. L. Clark, American Brake Shoe & Foundry Company, space economies resulting from the development of continuous molding. A general discussion will follow.

Wangler Boilers for St. Louis Cathedral

Among recent important contracts received by the Joseph F. Wangler Boiler & Sheet Iron Works Company, St. Louis, Mo., one worthy of note is signed by Archbishop John J. Glennon, for the new boilers to be installed in the St. Louis Roman Catholic Cathedral. These boilers are of the horizontal fire tube type and of sufficient capacity to take care of the entire heating system of the immense structure in the most inclement weather. They will be placed in a detached boiler house. A fuel economizer and smoke preventer of the latest improved Wangler type will be employed in connection with the boilers, enabling the operator every facility to comply with the ordinance of the city prohibiting the emission of dense black smoke and at the same time economize in the consumption of fuel. For the purpose of obtaining the most perfect combustion possible the perfected Wangler type steel casing setting will be installed. The Wangler Company has had an uninterrupted successful career of 50 years in the city of St. Louis. It was organized in 1864 by Joseph F. Wangler, who still is its chief executive. His sons, Charles J. Wangler, vice-president, and Joseph A. Wangler, secretary, are the other members of this company.

Lower Freight Rates on Eastern Iron Ores

There has been some readjustment of freight rates on iron ore from points in New Jersey and in southeastern New York to blast furnaces in eastern Pennsylvania, as a result of the suit brought before the Interstate Commerce Commission last year by B. Nicoll & Co., New York, and the Wharton Steel Company, Wharton, N. J. In deciding the case the Interstate Commerce Commission suggested that some of the inequalities complained of in iron ore rates might be remedied by the introduction of what it denominated a "non-haulage charge," presumably a charge for terminal service. This suggestion has not been acted upon, but rates from Ringwood, Wharton and Buttzville, N. J., and Sterlington and Fort Montgomery, N. Y., to eastern Pennsylvania furnaces have been reduced by 6 to 12 per cent.

A patent has been granted to Henry D. Hibbard, Plainfield, N. J., for making manganese steel. His object is to avoid the loss of manganese resulting from charging steel scrap containing 11 to 14 per cent. of manganese in the ordinary way, since nearly all the manganese must be oxidized before any carbon can be eliminated. He melts this scrap in an electric furnace, covering it with a bath of decarbonized iron, thus protecting the scrap while fusion is proceeding. The ordinary charge of an open-hearth furnace can be worked down to 0.15 per cent. carbon, and the manganese steel scrap thrown into this bath; or the scrap can be heated in the furnace to not more than red heat and then covered with molten iron of the above carbon content.

The steel shelving bins and metal lockers in the plant of the Continental Motor Mfg. Company, described in *The Iron Age* of March 6 with particular reference to unusual features of the factory construction, were installed by the Terrell's Equipment Company, Grand Rapids, Mich.

ESTABLISHED 1855

THE IRON AGE

Published Every Thursday by the
David Williams Company
 239 West 39th Street New York

W. H. Taylor - *President and Treasurer*
 Charles G. Phillips - *Vice-President*
 Fritz J. Frank - *Secretary*
 M. C. Robbins - *General Manager*

Editors
 Geo. W. Cope A. I. Findley W. W. Macon
 Charles S. Baur - *Advertising Manager*

Branch Offices
 Chicago: Otis Building Philadelphia: Real Estate Trust Bldg.
 Pittsburgh: Park Building Cleveland: American Trust Building
 Boston: Equitable Building Cincinnati: Mercantile Library Bldg.

Entered at the New York Post Office as Second-class Mail Matter

Subscription price: United States and Mexico, \$5.00 per year; to Canada, \$7.50 per year; to other foreign countries, \$10.00 per year.

CONTENTS.

Plant of the Duff Mfg. Company, Pittsburgh.....	877
Motor-Driven Bar Twisting Machine.....	881
Adding Oxygen to Air Blast.....	881
An Interesting Conveyor Installation.....	882
Flexible Shaft with an Improved Core.....	883
New Type of Reciprocating Air Pump.....	884
New Large Rack-Driven Slotting Machine.....	885
Demonstration of Talking Moving Pictures.....	885
Automobile Makers Are to Investigate Fuels.....	885
Growing Use of Commercial Motion Pictures.....	886
New Line of Bench Type Grinding Machine.....	887
Chemical Reactions of the Puddling Process.....	888
Determination of Chromium in Steel.....	890
New Device for Fastening Bolts in Masonry.....	891
Erecting One Building Around Another.....	892
Traveling Crane Trolley with Inclosed Gears.....	892
An Improved Type of Power Hammer.....	893
The Cost of Factory Sewage Disposal.....	893
The Improved Anderson Gear Rolling Machine.....	894
Tests of Vanadium Cast Iron.....	894
Metal Schedule of the Underwood Tariff.....	894A
New York State Steel Company Receivership.....	895
Foundrymen's Meetings.....	895
Wangler Boilers for St. Louis Cathedral.....	895
Lower Freight Rates on Eastern Iron Ores.....	895
The New Tariff Bill.....	896
The Iron Market and Its Reviewers.....	897
Fields for Industrial Progress.....	898
Correspondence.....	899
Pig-Iron Loss from Flood.....	900
New French Iron and Steel Plant.....	901
The Iron and Metal Markets.....	902
European Industries Large Users of Oxygen.....	913
Personal.....	914
Obituary.....	915
Pittsburgh and Vicinity Business Notes.....	915
Pennsylvania Steel Company Improvements.....	915
Blaw Steel Construction Company's New Plant.....	916
Workers Give Up the Rubber Tire Strike.....	916
Gathering International Testimony.....	916
March Copper Production and Stock.....	916
Mesta Equipment for Trumbull Steel Company.....	916
The Situation in the Flooded Districts.....	917
February Exports of Iron and Steel.....	919
The National Metal Trades.....	919
Some Very Powerful Electric Locomotives.....	920
Electric Power Output of the United States.....	920
Customs Decision.....	920
The Allis-Chalmers Company's Affairs.....	920
The Machinery Markets.....	921

The New Tariff Bill

Again the country has before it an Underwood tariff bill for consideration. The new bill has a better prospect of becoming law than its predecessors which were vetoed by President Taft. The bill introduced in the House of Representatives on Monday is a measure which provides for revision of the whole tariff, instead of parts, as was the case with its predecessors. It also provides for a complete readjustment of the raising of revenues for the support of the National Government.

The new bill is so comprehensive in its character, involving the broad question of the raising of revenue, that it is likely to require more extended consideration and will perhaps lead to more protracted discussion than if it was restricted to a revision of tariff duties. This is hardly what the country desired to see, as the hope had generally been expressed that tariff revision would be hastened and not retarded. A period of prolonged uncertainty regarding rates of duty cannot but check the volume of business in many branches of trade. It is possible that preparations for the passage of the bill have been so carefully made that not much change will be found in the final rates from those set forth in the bill as introduced. This, however, remains to be seen, as indications are beginning to appear of considerable dissatisfaction among members of the dominant party.

Our readers will receive as part of this issue the full text of the metal schedule, with present rates of duty interpolated for the purpose of comparison. It will be found that those who were looking for a conservative measure have been decidedly disappointed. The cuts in duties have been severe, amounting to about 50 per cent. of present rates. The duty on ferromanganese is a noteworthy exception, however, as the change from a specific duty of \$2.50 per ton to 15 per cent. ad valorem materially raises the cost of importation.

Drastic as the reductions have been on most iron and steel articles, the worst feature of this bill, as affecting the metal schedule, is that it places a number of iron and steel products on the free list. These products are cotton ties, all kinds of nails, tacks and spikes, horse and mule shoes, barb wire, wire for fencing and baling, and steel rails. The placing of these articles on the free list is largely a concession to the farming and cotton planting interests. It is not understood that the railroad companies have made any demand for the removal of the duty from steel rails and railroad spikes, but probably a statement found in the official "Analysis of New Tariff Bill" which accompanies the bill, alleging that "many items of manufacture controlled by monopolies have been placed on the free list," explains this particular provision. Possibly the framers of the bill believed they were striking at monopolies in the manufacture of these articles, but if so they are not fully informed, as these products are made by a number of manufacturers and not wholly by one company, or even related companies.

The free list also carries with it such highly finished products as cash registers, linotype machines, type setting machines, sewing machines, typewriters and agricultural implements. It is probable that the framers of the bill were striking at the International Harvester Company in placing agricultural implements on the free list, but that company does not manufacture the

full line, there being numerous manufacturers in all parts of the country engaged in making a long list of farming machinery, implements and tools. The manufacturers of cash registers, linotype machines, type setting machines, sewing machines and typewriters are probably subjected to attack because their products are partly controlled by patents and have been exported in large quantities.

It will be seen from foregoing paragraphs that no sort of logical or scientific method has been pursued in arriving at the rates of duties imposed in the bill. This is a violent departure from previous methods of tariff making in this country, and is completely at variance with methods pursued in devising tariff schedules by other great nations of the world. The effect may be serious as to the industries which are exposed to direct foreign competition. If business should be depressed throughout the world, the removal of the duties would undoubtedly subject these industries to sharp competition in a considerable part of this country, especially in the territory within reasonable distance of the seaboard or importing points. This fact has been in a measure recognized by the framers of the bill, as it carries for the first time in an American tariff measure a penalty for "dumping" foreign products in our markets.

It is a matter of great importance to the manufacturers of machine tools that the bill imposes a duty of 15 per cent. on imported machine tools instead of placing them on the free list, as was done in a previous Underwood bill. This duty may not be sufficiently high to afford adequate protection, but it is certainly much more favorable for the machine tool industry of this country than the removal of all duties. It would have been unfortunate indeed if these manufacturers had been compelled to bear the brunt of direct foreign competition.

The placing of iron ore on the free list was to be expected. The present duty on iron ore is only 15 cents a ton from other countries than Cuba and 12 cents a ton from Cuba. Such rates were not to be considered protective, and the revenue derived therefrom was hardly large enough to receive much consideration. Some of the consumers of foreign ores located near the seaboard will realize a little benefit from the removal of the ore duty, but it is a question whether the advantage derived in this way is not more than offset by the heavy reduction in duties on their finished products. We will know more in the next two or three years with regard to the ability of our iron and steel manufacturers to retain their business along the seaboard with the more favorable rates on importations, as it is not likely that the high prices of iron and steel now prevailing in Europe will continue for any considerable length of time. When foreign prices recede to what may be considered their normal level, and the demand abroad is not sufficient to keep European furnaces and mills going to their capacity, it must be admitted that the invitation extended to invade the markets of this country will not be overlooked. The general change to ad valorem rates will facilitate such invasion. Our specific rates have heretofore operated in times of depression to provide greater protection, but ad valorem duties, on the other hand, make our protection lower and lower as foreign prices decline. This is a bad feature of the bill from that standpoint, while ad valorem rates are also to be criticised as leading to endless controversies

regarding proper valuation and the correctness of the invoice. Opportunities for fraud will certainly be greatly increased.

The Iron Market and Its Reviewers

From a letter received last week by the editors of *The Iron Age* we take the following:

"During the last six months of 1912 the trade papers did their utmost to advance the prices of iron and steel commodities and gave a false value to them, and to-day there is not an iron reporting paper in the United States that is stating the facts as to the prices obtained on actual sales made. We are heavy buyers of pig iron; we do not report our purchases and the furnaces will not, because they are so far below the market you and other trade papers try to establish."

A letter received twenty-four hours later from a producer of pig iron contained this:

"Candor compels me to say that of late years I felt that your large advertisers have had something to do with the tone of the paper, so far as the market reports were concerned, and that you frequently leaned, through your special reports from different iron centers, toward the bearish side, when the conditions as to the cost of material, labor, etc., should have led you to try and stiffen the market for the sake of the producers. This is only a friendly criticism and I hope it will be received in this manner."

Our first thought was simply to print these two expressions and allow the reader to make his own comment. Both are from important firms, one interested in having high quotations and the other in having low quotations on pig iron in *The Iron Age's* market columns. The average reader's comment, perhaps, might be that such opposite criticisms would be accepted in this office as an indication that our pig iron quotations had closely represented the actual market.

But something more is called out by these letters. They are not the first complaints we have had of our market statements or of the prices we have quoted. Nor is this the first time producer and consumer have complained at once. It is perfectly natural for a producer of pig iron to want to have the market quoted at the figure he would like to get. On the other hand, the buyer, when he is approached by a salesman, would be glad to reinforce his contention for a lower price than is quoted him, by citing that given in a trade journal which is accepted as an authority. It should be just as obvious that the journal whose market reporters allowed themselves to acquire the viewpoint either of the buyer or the seller in the way that each of our correspondents has in mind, would promptly find the end of its usefulness as a gauge of the market. Our friend, the pig iron producer, considers it the duty of an iron trade journal "to try and stiffen the market for the sake of the producers"—in other words, to become the advocate of the seller. Our correspondent from whom we have quoted first charges an attempt in our reports to establish a market above that represented by the purchases of his firm.

The Iron Age has never conceived its duty to be to "try and stiffen the market" in view of labor and material cost or any other factor; on the other hand, to say that we "try to establish" a level of prices above the actual is just as far in the other direction from correctly stating what we aim to do in our market

reports. The only duty *The Iron Age* has ever recognized in this matter is to get the facts concerning market transactions and market tendencies and to present them fairly and accurately.

Iron market reporting is based on no exact science. The variables are many, and statements concerning prices and conditions are not a product of mathematical calculation. Out of the hundreds of definite statements made in a single issue concerning market happenings at various centers, in the great variety of products reported on in our columns, it would be remarkable if every reader's experience tallied with everything he read. The interest of those who give information, either as buyers or sellers, is always a factor. If all sellers and all buyers followed the policy of our buyer correspondent quoted above, and gave no information concerning transactions, there would be no market report. However, such a situation is not imminent. Not only has the reporting of iron and steel markets, as first developed by *The Iron Age*, been taken up elsewhere with good, bad and indifferent results, but sources of news are more numerous than ever, and the race of those who would give the market the "protection" of secrecy is running out. The function of the impartial market review, the work of careful and experienced investigators who have more than surface channels of information, is recognized as it has not been before. Speaking for the present editors of this paper and those who have preceded them, it is to be said that all have written of the iron market with full appreciation of their responsibilities. The fact that settlements on hundreds of thousands of tons of coke, pig iron and rolled iron and steel products are made each year at *The Iron Age's* quotations is the strongest expression of confidence that buyers and sellers could give.

Fields for Industrial Progress

A frequently quoted aphorism of the late J. Pierpont Morgan, referring to the disaster in store for the man who is a bear on the future of the United States, can well be applied to the industrial progress of the whole world. The marvelous achievements of the past quarter century are merely suggestive that man can do much more. Progress in no direction has been toward a wall which would limit further advance, but rather, as progress has been made, fields have opened up.

The conservation movement, which in the strict sense of the expression was set on foot five years ago, has done much already for the people of the United States. There has been an incidental benefit from this movement which has not been generally recognized, and yet in the last analysis it is a very important benefit. We refer to the fact that agitation of the possible depletion of certain natural resources at various times in the future has developed counter arguments which took for their basis the fact that the arts and sciences are constantly advancing, and future generations may not need the resources which we find so necessary. Thus it has been emphasized in an important way that progress is continually being made, and that great progress will undoubtedly be made in future. Men have thereby been stimulated and encouraged.

A pertinent example is the attention directed to the limited duration of iron ores as now known, the suggestion that future generations may be hard put

to find iron ore being met by the double rejoinder that fresh deposits of iron ore are constantly being found, whereby the visible supply is constantly increasing, and that means will doubtless be found, while we are engaged in smelting our present reserves, to utilize economically ores of much lower grade, of which the known tonnage already is many times that of ore of the present commercial standard.

Another and more valuable example is the sources from which future generations will draw power. The conservation movement made much of the inevitable early exhaustion of coal fields now being worked, which promptly encouraged more careful search for other coal deposits and more exhaustive study of the less known deposits. Much more important, it gave a very important stimulus to study of possible means for utilizing solar energy. So important do we regard our coal reserves that it is impossible for us to realize how tremendous is the amount of energy which daily reaches the earth from the sun. Figures when cited only daze, or provoke suspicion that there must have been a misprint—the statement, for instance, that daily there falls upon the Desert of Sahara solar energy equivalent to the world's production of coal for six years. Obviously, even had we unlimited supplies of coal, it would be worth while to devote much research to the question of utilizing the solar energy which is lavished upon the earth's surface, for a means discovered might easily prove more economical than the use of the most easily mined coal man has ever had, and a fruit of the conservation movement of no small value has been the stimulus it has given to such investigation.

That nature cannot be improved upon is no longer an acceptable statement to the thinking man. A pertinent illustration, since we are on the subject of solar energy, is that nature is raising on the earth's surface an annual total of vegetable matter equivalent to 18 billion tons of coal. In the first place, this represents only a very small fraction of the solar energy which falls upon the earth's surface, and in the second place this vegetable matter is very poorly calculated indeed to serve man's needs. Improvement, instead of appearing difficult, seems to be the easiest thing imaginable. Nothing is simpler than that man should make industrial progress, when such fields are open.

We have only started to develop mental and manual efficiency in the human organism, but who that has given the matter a moment's consideration can deny that there is here also offered an almost unlimited field? An aged and distinguished scientist recently created a mild sensation by the declaration that he did not believe that in 6000 years man had made any progress in intellect or morals. The statement had limited application, reading it closely, for it applies only to the individual's own powers and not to what he may accomplish or do through having at his command, intellectually, the world's accumulation of knowledge, or, morally, having upon him the force of the world's example and influence. Even in its most limited interpretation, of course, the statement will not be generally accepted; but even if it were it cannot possibly follow that much progress may not be made in sixty years or six years even were it the case that none has been made in six thousand. We already know it to be a fact that the human mind to-day is being made more efficient. The human brain cells have enormous powers which have not been de-

veloped along useful lines, suggestions of which fact come from the performances of chess players, lightning calculators and the like.

Enough has surely been suggested here to indicate the reasonableness of the contention that the man who is a bear on the future of the world's industrial progress will go bankrupt. Every man who is a bull on its future may not be successful, but some at least will achieve wonderful successes. Never has it been clearer that progress is to continue.

Correspondence

How the Employee Regards Want Advertisements

To the Editor:—The letter by C. R. M. in *The Iron Age* of March 27 is interesting and I can throw some light on the other side of the fence. While I was advancing from apprentice boy to my present position, which I flatter myself calls for a "high grade man," I had innumerable experiences with "want ads." I have been an advertiser for work and an answerer of advertisements with the result that when I wanted a new place I quit the one I had and with my tools went looking personally for the job I wanted.

Want advertisements are necessarily brief. A workman is usually limited somewhat as to funds and must say all the good about himself in as few words as possible. I have been fortunate or unfortunate enough to have received some replies, most of which were ridiculous. They were like this: "We are looking for a man; give us complete information regarding yourself, your references and the salary you would be willing to start at."

What kind of an answer can a man make to a letter of that kind, especially when he is not a skilled correspondent? He knows nothing of the work or its responsibilities. He wishes to sell his services, but is perhaps attempting to obtain a position for which he is not qualified. Usually my replies were long, carefully handwritten letters and were unanswered. Occasionally I have received replies and you may be sure these companies have been remembered and I have been the means of throwing some little business their way.

When employers answer a "want ad," why is it not practicable to give some information as to the requirements to enable handling the request in an intelligent manner? Why do they expect a man to name a price before knowing anything of the place and why is he always expected to have a "starting price" with another to be paid later? When I was younger (I am not very old now) I had starting prices every time I took a new job and the result was that after seven years I had considerably advanced as to responsibilities, but very little in pay. Experience has taught me something besides shopwork.

I believe that the majority of mechanics are honest and not seeking places they cannot fill. Many failures are directly due to the employment of cheap men for responsible positions, men who are willing to make a low "starting price" and I should suggest that such men be viewed with suspicion by employers. Many failures are also due to the employer's not having given complete information regarding the work to be done and its responsibilities. Some men are over enthusiastic, but the careful employer can separate these.

I have not reached the top, nor have I given up looking for a more advanced position, but I have no "starting price." The idea of working up to a position and then, in hopes of eventually doing better, sacrificing the work of a year or two is poor business. If the average man would stop to consider the length of time before he again arrives at the point he is giving up, hold on to his present job and put the difference between his present pay and the "starting price" regularly in the bank he will, after a term of years, be better off in every way.

An experience showing how some companies handle employment matters came to my notice very recently. A friend of mine told me of a company seeking a man of my experience. I wrote the company giving my experience

and qualifications for the place as I understood it. The reply to my letter stated: "We do not believe you have sufficient experience to handle the position open, but we would like to have the price at which you would be willing to start. Upon receiving this information we shall consider your application." Isn't that an illuminating letter and doesn't it give the prospective employee an excellent idea of the company and the work? Isn't the correspondence handled in a careful and intelligent manner?

How can employers of men hope to employ "high grade" men when the matter is handled in such a crude way? I am not a kicker unless it is to improve conditions, neither have I a grudge against the "want ad," nor against employers. But I have become disgusted with the way in which the "want ads" have been abused and the customs that have clustered about them. Many desirable men pay no attention to them and still are on the watch for better positions.

MILLER.

To the Editor:—The writer heartily indorses the remarks of C. R. M. printed in *The Iron Age* of March 27, on "How to Advertise for High Grade Men." He might add that very many good men will positively not answer a blind "ad" thinking that it may be their own employers who are advertising. This is particularly true in highly specialized lines when one company advertises in the local paper of the town in which a competitor is located, expecting in this manner to get some of the competitor's employees. An advertisement should be repeated a few times if possible. Good men are not constantly scanning such advertisements and it may be some time before they notice it or hear of it.

Among draftsmen ability, salaries and the various lines in which they specialize vary to a great extent. Very few ads for engineering help, especially those in daily papers, more particularly those spelling it "Draughtsman," when fully analyzed, give the applicant the desired information. One concern may advertise for a chief draftsman and expect to pay \$200 or \$300 a month, while another which is long on titles and short in pay wants a similar man, possibly a mechanical engineer for \$75 to \$100 per month.

Location is an important factor. In addition to many other reasons a man frequently cannot stand a certain location or climate, or if married, the same may hold true with regard to a member of his family. Again, a man, whether single or married, cannot be expected to pay the cost of moving from the Atlantic coast to Chicago, New Orleans or San Francisco and the higher cost of living in those localities and at the same time accept the same salary that he would take if making a change in his home town. With all these and many other points to be considered, particularly by the married man, we find in a large number of cases that his letter will be ignored if the least salary is not stated in the first letter. Such ads prove conclusively that the salary is of more importance than ability.

One of the reasons that first-class men cannot be gotten or kept by some firms is the comparatively low wage paid. For example, many drawing rooms have a fixed maximum salary which they pay to draftsmen. This maximum figure never changes, but the cost of living and the mechanic's wage go up so they naturally cannot draw higher priced men from other offices. Very few advertisements state whether the position is temporary or permanent. Many firms are ever ready to lay off men at the first sign of dull times. Such information is carried from place to place by ex-employees and the concern gets a corresponding reputation. A few employers who don't believe in the golden rule expect good men to report on a couple of days' notice.

J. F. B.

The Independent Harvester Company of Plano, Ill., is ready to receive bids on a new foundry, 136x208 ft., and a mill room 80x136 ft., three stories. The foundry is to be of modern steel construction, and the mill room of reinforced concrete. These are the first buildings of a large plant which the company proposes to build and equip in the next three years.

John I. Beggs of St. Louis and other capitalists are preparing for the construction of a large hydroelectric plant on the Fox River at or near Neenah, Wis.

Pig-Iron Loss from Flood

March Output More than Expected

A Rate of 89,147 Tons a Day Against 92,369 Tons in February

The curtailment of pig-iron production in March, due to the floods in the Central West, was not as great as was feared, though this month's output is still suffering from the same cause. The coke and anthracite furnaces produced 2,763,563 tons last month, or 89,147 tons a day, against 2,586,337 tons in the 28 days of February, or 92,369 tons a day. Furnaces counted as in blast April 1 (though some of them did not resume until a few days later) numbered 293, or 10 less than on March 1. While an accurate estimate of capacity active at the opening of this month cannot be made, we put it at 89,915 tons a day, against 93,085 tons a day on March 1—a reduction of 10 in number of furnaces and of 3171 tons a day in capacity.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from March, 1912, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons.			
	Steel works.	Merchant.	Total.
March, 1912	58,961	18,630	77,591
April	61,024	18,157	79,181
May	62,018	19,033	81,051
June	60,799	20,559	81,358
July	58,168	19,570	77,738
August	59,464	21,582	81,046
September	59,102	23,026	82,128
October	62,820	23,952	86,772
November	62,817	24,878	87,695
December	63,770	25,996	89,766
January, 1913	63,921	26,251	90,172
February	64,005	28,364	92,369
March	61,448	27,699	89,147

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in March and the four months preceding.

Monthly Pig-Iron Production—Gross Tons.					
	Nov. (30 days)	Dec. (31 days)	Jan. (31 days)	Feb. (28 days)	Mar. (31 days)
New York	169,677	184,899	188,943	180,789	188,335
New Jersey	6,167	5,609	5,833	5,644	11,100
Lehigh Valley	94,831	91,393	99,470	93,552	103,428
Schuylkill Valley ..	78,413	80,513	80,223	65,362	78,137
Lower Susquehanna and Lebanon Val.	60,313	66,161	72,172	69,205	76,612
Pittsburgh district..	567,868	626,688	626,118	569,457	639,832
Shenango Valley ..	133,819	149,404	152,065	145,464	132,536
Western Pennsylv'a	160,134	163,473	163,563	147,279	166,825
Maryland, Virginia and Kentucky ...	49,140	58,526	61,026	61,704	65,808
Wheeling district ..	114,632	124,708	111,595	114,979	103,001
Mahoning Valley ..	242,952	245,691	259,756	255,425	235,342
Central and North- ern Ohio	236,198	246,666	246,709	208,822	218,169
Hocking Valley, Hanging Rock and S. W. Ohio..	39,231	38,108	29,247	35,981	40,354
Chicago district ..	398,678	411,213	402,408	357,700	392,297
Mich., Minn., Mo., Wis., Col., Wash.	75,697	84,190	83,750	79,875	88,671
Alabama	167,408	171,090	180,790	164,642	186,940
Tennessee	35,696	34,405	31,863	30,457	35,954
Total	2,630,854	2,782,737	2,795,331	2,586,337	2,763,563

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons.						
Pig. Total production—			Spiegeleisen and ferromanganese			
	1911.	1912.	1913.	1911.	1912.	1913.
January	1,128,448	1,483,153	1,981,560	8,360	22,622	15,631
February	1,185,782	1,550,995	1,792,154	12,821	15,950	20,131
March	1,518,063	1,827,792	1,904,878	11,784	11,538	20,546
April	1,434,142	1,830,717	.....	10,657	11,104	.....
May	1,310,378	1,922,557	.....	13,641	20,518	.....
June	1,281,241	1,823,958	.....	22,611	25,685	.....
July	1,316,646	1,803,205	.....	17,067	26,522	.....
August	1,460,610	1,843,404	.....	14,579	24,225	.....
September	1,490,898	1,773,073	.....	17,757	22,484	.....
October	1,550,884	1,947,426	.....	19,697	27,252	.....
November	1,452,907	1,884,524	.....	19,678	17,461	.....
December	1,453,446	1,976,870	.....	20,068	18,523	.....

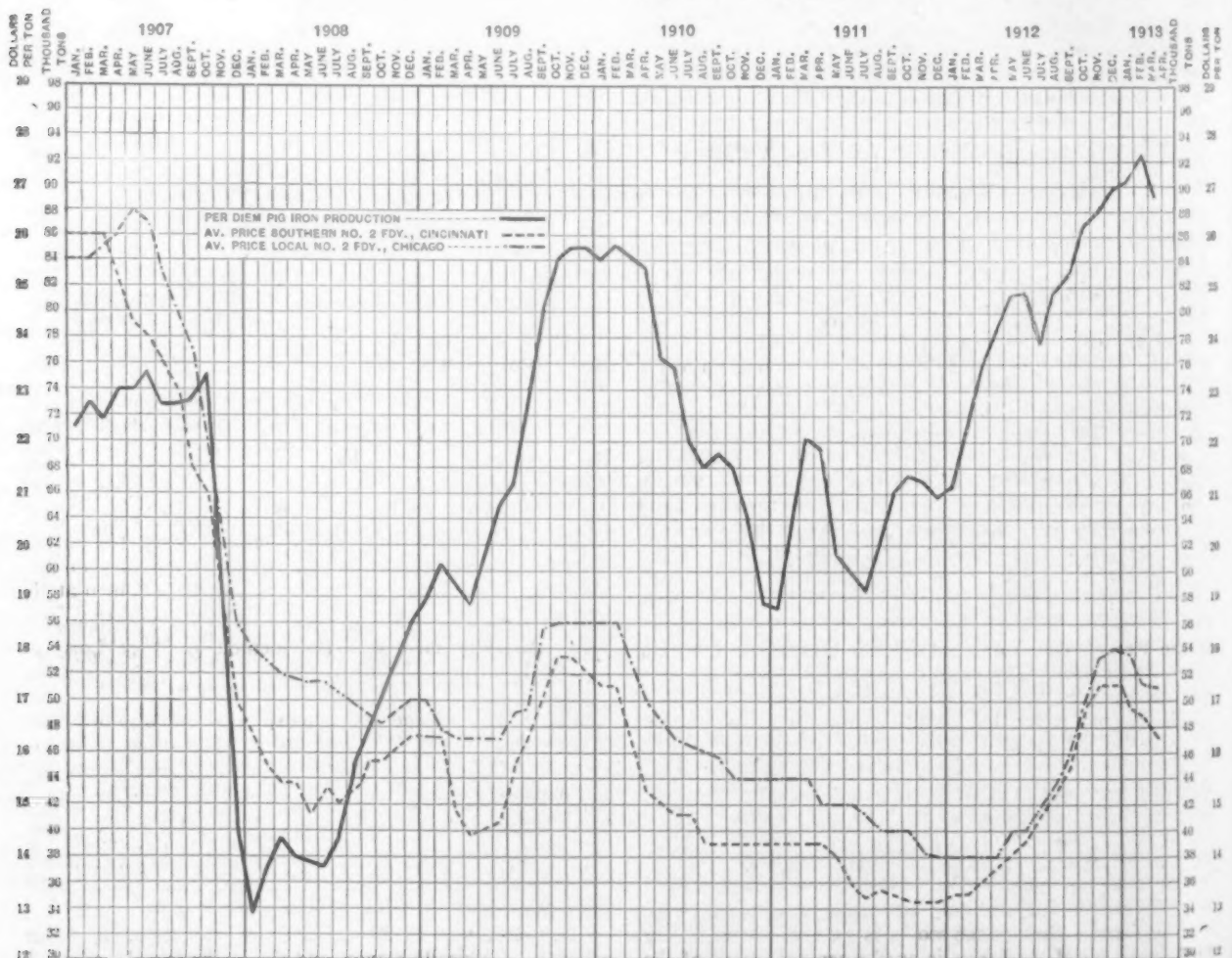


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1913, to April 1, 1913; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Capacity in Blast April 1 and March 1

The following table shows the daily capacity, in gross tons, of furnaces in blast April 1 and March 1 by districts:

Coke and Anthracite Furnaces in Blast.					
Location of Furnaces.	Total number of stacks.	Number in blast.	Capacity per day.	Number in blast.	Capacity per day.
<i>New York:</i>					
Buffalo	19	18	5,748	18	5,856
Other New York.....	7	3	577	3	601
<i>New Jersey:</i>					
.....	7	2	358	2	352
<i>Pennsylvania:</i>					
Lehigh Valley	22	15	3,162	15	3,313
Spiegel	2	2	175	2	178
Schuylkill Valley	16	10	2,522	10	2,553
Lower Susquehanna.....	7	6	1,241	6	1,325
Lebanon Valley	10	7	1,121	9	1,229
Pittsburgh District	51	48	20,570	46	19,782
Spiegel	3	3	474	3	541
Shenango Valley	19	15	4,130	18	5,255
Western Pennsylvania	27	19	5,382	19	5,350
Maryland	4	3	867	3	827
Wheeling District.....	14	11	3,910	11	4,106
<i>Ohio:</i>					
Mahoning Valley.....	24	21	8,490	23	9,122
Central and Northern	24	19	7,050	20	7,458
Hocking Val., Hanging					
Rock, & S. W. Ohio	15	7	1,025	9	1,305
Illinois and Indiana.....	34	30	12,042	32	12,755
Spiegel	2	0	0	0	0
Mich., Wis. and Minn.....	10	9	1,774	9	1,850
Colorado, Mo. and Wash	8	3	1,087	3	1,094
<i>The South:</i>					
Virginia	23	7	968	7	977
Kentucky	5	0	0	2	289
Alabama	46	25	6,082	24	5,880
Tennessee	20	10	1,160	9	1,088
Total.....	419	293	89,915	303	93,086

In view of the well-known conditions at the blast furnaces which were banked because of the flood, and the temporary character of the interruption, we have counted all such furnaces in the active list, as of April 1, where their resumption has been reported in the past week, though this may have been a few days after the first day of the month. To count them as inactive, when they will be producers for nearly all the days of April, would be to give a misleading forecast of the probable rate of production for this month. Furnaces which were blown out because of the flood or that are still out of blast for that reason, with time of resumption indefinite, are omitted from the active list as of April 1.

Among furnaces blown out in March were Lebanon Valley (Meily) and Sheridan in the Lebanon Valley, one

Shoenberger in the Pittsburgh district, Sharpville and Stewart in the Shenango Valley, Alleghany (Iron Gate) in Virginia, Hannah and one Haselton in the Mahoning Valley, Franklin in Ohio, one Calumet and one Joliet in the Chicago district.

Furnaces blown in last month include one Eliza, one Carrie and one Monongahela in the Pittsburgh district, Dora in Virginia, one Central at Cleveland and one Oxmoor in Alabama.

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The figures for daily average production are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.										
	1907.	1908.	1909.	1910.	1911.	1912.	1913.			
January	71,149	33,918	57,975	84,148	56,752	66,384	90,172			
February	73,038	37,163	60,976	85,616	64,090	72,442	92,369			
March	71,821	39,619	59,232	84,459	70,036	77,591	89,147			
April	73,885	38,289	57,962	82,792	68,836	79,181	.....		
May	74,048	37,603	60,753	77,102	61,079	81,051	.....		
June	74,486	36,444	64,656	75,516	59,585	81,358	.....		
July	72,763	39,287	67,793	69,305	57,841	77,738	.....		
August	72,594	42,851	72,546	67,963	62,150	81,046	.....		
September	72,783	47,300	79,507	68,476	65,903	82,128	.....		
October	75,386	50,554	83,856	67,520	67,811	86,772	.....		
November	60,937	51,595	84,917	63,659	66,648	87,695	.....		
December	39,815	56,158	85,022	57,349	65,912	89,766	.....		

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1908—Gross Tons.										
	1908.	1909.	1910.	1911.	1912.	1913.				
Jan.	1,045,250	1,797,560	2,608,605	1,759,326	2,057,911	2,795,331				
Feb.	1,077,740	1,707,340	2,397,254	1,794,509	2,100,815	2,586,337				
Mar.	1,228,204	1,832,194	2,617,949	2,171,111	2,405,318	2,763,563				
Apr.	1,149,602	1,738,877	2,483,763	2,064,086	2,375,436	.....			
May	1,165,688	1,883,330	2,390,180	1,893,456	2,512,582	.....			
June	1,092,131	1,930,866	2,265,478	1,787,566	2,440,745	.....			
July	1,218,129	2,103,431	2,148,442	1,793,638	2,410,889	.....			
Aug.	1,359,831	2,248,930	2,106,847	1,926,637	2,512,431	.....			
Sept.	1,418,998	2,385,206	2,056,275	1,977,102	2,463,839	.....			
Oct.	1,567,198	2,599,541	2,093,121	2,102,147	2,689,933	.....			
Nov.	1,577,854	2,547,508	1,909,780	1,999,431	2,630,854	.....			
Dec.	1,740,912	2,635,680	1,777,817	2,043,270	2,782,737	.....			

New French Iron and Steel Plant

An Important Operation Partly Financed in Germany—Plans for the Treatment of Iron Ores

The February issue of the *Revue de Metallurgie* contains three articles dealing with the new plant to be built at Caen in Normandy, concerning the power developments of which a short article appeared in these columns March 27, 1913. The first paper is by M. Robert le Chatelier and relates in detail the negotiations leading up to the formation of the company, which created great interest in industrial, financial and even political circles. As finally constituted the capital of the Société des Hauts-Fourneaux et Acieries de Caen is \$6,000,000, of which \$2,200,000 was subscribed by Herr Thyssen, \$2,200,000 by the French company of which M. Louis le Chatelier is president, and the remainder by two French groups closely connected with this same company, the Société Française de Constructions Mécaniques. Thus 63.3 per cent. of the stock will be in French hands and it is not impossible that this amount may be still further increased, so that the desire of the French Government (a desire which resembled an order) that Herr Thyssen's participation should be less than 50 per cent. has been carried out.

The second paper, by M. L. Cayeux, professor of geology at the College of France and the School of Mines, is on the neighboring ore bodies of the Urville basin from which at least the bulk of the ore will be obtained. Instead of being a simple syncline, as was supposed, it is composed of two synclines separated by a small anticline. Sections of the formations are given. This is very important from an economic standpoint, as it brings the ore body nearer the surface than was thought to be the case. It is estimated that 70,000,000 tons can be mined. The third paper, by M. de Loisy, is on the general layout of the plant, and gives a good deal of detail. The coke ovens are to be of the by-product type, and tar, ammonia and

benzole will be obtained from the gas. The ore is a carbonate changed to hematite in the upper part occurring in a bed 50 metres thick, and after calcining, gives on the average 45 per cent. iron, and 20.22 per cent. silicious material. The problem of calcining is important because ore has to be calcined for the plant at Caen and for shipment, the empty cars bringing back fuel from Westphalia. It is estimated that at the beginning this tonnage will be 1,200,000 annually. Vertical calcining furnaces similar to those now in use in the Cleveland district in England have been chosen in preference to inclined rotating kilns. Two blast furnaces are to be erected at first, with plans made for six, the output of each to be 375 to 400 tons per 24 hours, and considerable detail is given regarding the special charging arrangement, the bin system and the water cooling. There are to be five stoves per furnace designed by M. Ch. Perard to utilize fully the whole contract surface of the brick work. These are also illustrated. It is intended to use dry cleaning for the blast furnace gases, and to adapt a modification of the "bag-house" method of filtering now used in the metallurgy of lead. An experiment with this method by M. de Loisy at the steel works of Makievka has given very good results.

The calcined ore if used alone will give an iron containing 1.70 to 1.80 per cent. phosphorus and 0.40 per cent. manganese. It would be easy and inexpensive to make additions to the charge and produce an iron suitable for the basic Bessemer process. The basic slag obtained would have a ready market for agricultural purposes. Other possible processes are mentioned, in particular that of the Hoersch modification of the open hearth, which gives excellent steel, and also high phosphorus slag. Apparently no method has yet been definitely decided on.

The remainder of the article deals with the mills, which are to be electrically driven, and the methods to be adopted for developing this power both for the plant and the neighboring ore mines at Soumont.

G. B. W.

The Iron and Metal Markets

Flood Orders Not Heavy

Repair Work Will Require Time

Pig Iron Declines Further—Output Reduced Less than Thought

With the iron trade still trying to measure the market effects of the Central Western floods, the proposed cuts in the iron and steel tariff suddenly come up for appraisal. Most of the latter have been in view for months and they come at a time when both American and European mills are full of work. They are thought of, therefore, not as factors in the present market, but as likely to be reckoned with some months hence. The putting of rails on the free list is much talked about outside the trade. With specifications as exacting as they are today, when as many as 10 railroad inspectors are at work in a single mill at one time, to insure the highest quality, the dangers of invasion by foreign rails are greatly minimized.

Our blast furnace statistics indicate that the flood curtailment of pig iron output in March was 100,000 to 125,000 tons. April will show a further loss, partly from short coke supply; but outside of the four or five furnaces blown out because of flood damage practically all that were idle April 1 are now running, though not yet at the normal pace.

Pig iron production in March was 2,763,563 tons, or 89,147 tons a day, against 2,586,337 tons in the 28 days of February, or 92,369 tons a day. Steel works furnaces fell off 2557 tons a day from the February rate and merchant furnaces 665 tons a day. On April 1 the daily capacity of the 293 active furnaces was 89,915 tons, against 93,086 tons a day for 303 furnaces one month previous.

The amount of steel ordered to take care of bridge repairs and other work due to the floods has been overestimated and it is now evident that it will be spread over a longer period than was at first thought. Railroads have asked for early fabrication and erection in some cases; but the Pennsylvania Lines West, for example, instead of wanting 30,000 tons as reported, ordered 1400 tons and will need about 2000 tons more. The railroads are making their temporary timbered and other structures answer in smaller breaks until steel can be fabricated and erected. In some cases wider and heavier bridges will be built, which will take time.

Generally, specifications in March exceeded shipments of mill products, and the net result of the floods has been to give strength to the market. Besides structural steel, the floods have brought a demand for spikes, nails, corrugated sheets and all track supplies. Preference is given by the mills to railroad orders for repair and emergency work.

Eastern steel companies have made a number of small sales of rolling and forging billets to make up shortages due to the Central Western shutdowns. The affected steel plants in Ohio and Western Pennsylvania are all in operation again, but not in full, and finishing mills, particularly sheet and tin plate mills, continue to be hampered by short steel supply.

There is less selling of sheets at concessions, the two new mills which went out actively for business having accumulated fair orders. The American Sheet & Tin Plate Company is now operating 69 per cent. of its hot sheet mill capacity and 87 per cent. of its hot tin mills.

The widely published buying of 60,000 boxes of

Welsh tinplate by the Standard Oil Company is chiefly significant of the difficulty of getting early shipment tin plates at home. As the purchase is for export, with the drawback, the tariff is not a factor. Last year when Welsh tin plates were high and before the accumulation of 1,000,000 to 1,500,000 boxes there, the Standard Oil Company bought nearly all its tin plate in this country.

Free cotton ties will not come in time for this year's crop; but in any event foreign production is not heavy. Thus far domestic hoop mills have had too profitable a business in other lines to accumulate the usual stock of cotton ties.

In the Central West, though the floods shortened pig-iron output, prices show weakness and melters are not hurrying to buy for the last half. Buffalo furnaces alone report any considerable sales and these were largely for Canadian and Eastern shipment.

A few large buyers have been trying out the market in the East and considerable concessions from recent figures have been offered. For No. 2 X foundry \$15 at Virginia furnace and \$16 at Eastern Pennsylvania furnace have been done. At Buffalo the \$16 basis now possible represents a decline of \$1.50 from December. In northern Ohio quotations have been made below \$16 at furnace.

On Southern iron \$12.50, Birmingham, for No. 2 is more common and some furnaces will sell freely at \$13 for the second half.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month, and one year previous.

	April 9,	April 2,	Mar. 12,	April 10,
Pig Iron, Per Gross Ton:	1913.	1913.	1913.	1912.
Foundry No. 2 X, Philadelphia.	\$17.75	\$17.75	\$17.80	\$15.00
Foundry No. 2, Valley furnace.	16.00	16.00	17.00	13.25
Foundry No. 2 S'th'n, Cin'ti...	25.75	16.25	16.25	13.75
Foundry No. 2, Birmingham, Ala.	12.50	13.00	13.00	10.50
Foundry No. 2, furnace, Chicago*	17.25	17.25	17.25	14.00
Basic delivered, eastern Pa.....	17.00	17.00	17.75	15.00
Basic, Valley furnace.....	16.00	16.00	16.10	13.00
Bessemer, Pittsburgh.....	17.90	17.90	18.15	15.15
Malleable Bessemer, Chicago*	17.25	17.25	17.25	14.00
Gray forge, Pittsburgh.....	16.65	16.75	16.90	13.65
Lake Superior charcoal, Chicago	18.00	18.00	18.00	15.75

Billets, etc. Per Gross Ton:	28.50	28.50	28.50	20.00
Bessemer billets, Pittsburgh....	29.00	29.00	29.00	20.00
Open-hearth billets, Pittsburgh....	36.00	36.00	36.00	25.00
Open-hearth billets, Philadelphia	30.00	30.00	32.00	22.40
Wire rods, Pittsburgh.....	30.00	30.00	30.00	25.00

Old Material, Per Gross Ton:	16.25	16.25	16.25	15.25
Iron rails, Chicago.....	18.25	18.00	18.00	15.50
Iron rails, Philadelphia.....	16.75	16.75	16.75	13.00
Carwheels, Chicago.....	15.00	15.00	15.00	13.00
Carwheels, Philadelphia.....	14.25	14.25	14.25	13.00
Heavy steel scrap, Pittsburgh....	12.50	12.50	12.00	11.00
Heavy steel scrap, Philadelphia..	13.50	13.75	12.50	12.75

Finished Iron and Steel,	Cents.	Cents.	Cents.	Cents.
Per Pound to Large Buyers:	1.25	1.25	1.25	1.25
Bessemer rails, heavy, at mill...	1.67½	1.67½	1.67½	1.27½
Iron bars, Philadelphia.....	1.70	1.70	1.70	1.25
Iron bars, Pittsburgh.....	1.57½	1.57½	1.57½	1.15
Iron bars, Chicago.....	1.40	1.40	1.40	1.15
Steel bars, Pittsburgh, future..	1.85	1.85	1.85	1.15
Steel bars, Pittsburgh, prompt..	1.56	1.56	1.56	1.31
Steel bars, New York, future..	2.01	2.01	2.01	1.31
Steel bars, New York, prompt..	1.45	1.45	1.45	1.20
Tank plates, Pittsburgh, future..	1.70	1.70	1.70	1.20
Tank plates, Pittsburgh, prompt	1.61	1.61	1.61	1.31
Tank plates, New York, future..	1.76	1.76	1.76	1.31
Tank plates, New York, prompt	1.45	1.45	1.45	1.20
Beams, Pittsburgh, future.....	1.70	1.70	1.70	1.20
Beams, Pittsburgh, prompt.....	1.61	1.61	1.61	1.31
Beams, New York, future.....	1.76	1.76	1.86	1.31
Beams, New York, prompt.....	1.45	1.45	1.45	1.20
Angles, Pittsburgh, future.....	1.70	1.70	1.70	1.20
Angles, Pittsburgh, prompt.....	1.61	1.61	1.61	1.31
Angles, New York, future.....	1.76	1.76	1.86	1.31
Angles, New York, prompt.....	1.45	1.45	1.45	1.10
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.15
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.25
Steel hoops, Pittsburgh.....				

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Pound to Large Buyers:	April 9, April 2, Mar. 12, April 10,			
	1913. Cents.	1913. Cents.	1913. Cents.	1912. Cents.
Sheets, black, No. 28, Pittsburgh	2.35	2.35	2.35	1.85
Wire nails, Pittsburgh.....	1.80	1.80	1.75	1.60
Cut nails, f.o.b. Eastern mills..	1.80	1.80	1.80	1.55
Cut nails, Pittsburgh.....	1.70	1.70	1.70	1.55
Fence wire, ann'd, 0 to 9, Fgh.	1.60	1.60	1.55	1.40
Barb wire, galv., Pittsburgh....	2.20	2.20	2.15	1.90

Coke, Connellsville, Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	\$2.00	\$2.25	\$2.40	\$2.25
Furnace coke, future delivery..	2.25	2.25	2.50	2.25
Foundry coke, prompt shipment	3.00	3.00	3.00	2.75
Foundry coke, future delivery..	3.00	3.00	3.00	2.75

Metals, Per Pound to Large Buyers:				
	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	15.62½	15.37½	15.12½	16.00
Electrolytic copper, New York..	15.37½	15.12½	15.00	15.87½
Spelter, St. Louis.....	5.75	5.75	6.25	6.60
Spelter, New York.....	5.90	5.90	6.40	6.75
Lead, St. Louis.....	4.20	4.20	4.20	4.12½
Lead, New York.....	4.35	4.35	4.35	4.20
Tin, New York.....	48.25	48.00	46.60	43.40
Antimony, Hallett, New York....	8.50	8.50	8.50	7.75
Tin plate, 100-lb. box, Pittsburgh	\$3.60	\$3.60	\$3.60	\$3.30

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6½ in. up to 100 in. wide, 1.45c. to 1.70c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft., down to the weight of 3-16 in., take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras,	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.....	.10
Gauges under No. 8 to and including No. 2.....	.15
Gauges under No. 16 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.45c. to 1.70c. extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.....	.10
H-beams over 18 in.....	.10
Angles over 6 in. on one or both legs.....	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909.....	.70
Tees, structural sizes (except elevator, hand rail, car-truck and conductor rail).....	.05
Angles, channels and tees, under 3 in. wide as per steel bar card, Sept. 1, 1909.....	.20 to .80
Deck beams and bulb angles.....	.30
Hand rail tees.....	.75
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55
No charge for cutting to lengths 3 ft. and over.	

Wire Rods and Wire.—Bessemer, open-hearth and chain rods, \$30. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, \$1.60; galvanized, \$2. Galvanized barb wire, to jobbers, \$2.20; painted, \$1.80. Wire nails, to jobbers, \$1.80.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.									
Nos.	0 to 9	10	11	12 & 12½	13	14	15	16	
Annealed	\$1.75	\$1.80	\$1.85	\$1.90	\$2.00	\$2.10	\$2.20	\$2.30	
Galvanized	2.15	2.20	2.25	2.30	2.40	2.50	2.90	3.00	

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe (full weight) in effect from January 1, 1913, iron pipe (full weight), from October 21, 1912:

Steel.						Iron.					
Inches.			Black.			Inches.			Black.		
¾, 1 and 1½	73	52½	¾ and 1	67	48	¾ and 1	67	48	¾ and 1	67	48
1½ to 2	77	66½	1½ to 2	66	47	1½ to 2	66	47	1½ to 2	66	47
2 to 3	80	71½	2 to 3	70	57	2 to 3	70	57	2 to 3	70	57
			3 to 4	73	62	3 to 4	73	62	3 to 4	73	62
Lap Weld.						Lap Weld.					
2	77	68½	1½	57	46	2	77	68½	1½	57	46
2½ to 6	79	70½	1½	68	57	2½ to 6	79	70½	1½	68	57
7 to 12	76	65½	2	69	59	7 to 12	76	65½	2	69	59
13 to 15	53	..	2½ to 4	71	62	13 to 15	53	..	2½ to 4	71	62
			4½ to 6	71	62				4½ to 6	71	62
			7 to 12	69	56				7 to 12	69	56

Plugged and Reamed.						Plugged and Reamed.					
1 to 3, butt.....	78	69½	1 to 1½, butt.....	71	60	1 to 3, butt.....	78	69½	1 to 1½, butt.....	71	60
2, lap.....	75	66½	2, butt.....	72	61	2, lap.....	75	66½	2, butt.....	72	61
2½ to 4, lap.....	77	68½	1½, lap.....	55	44	2½ to 4, lap.....	77	68½	1½, lap.....	55	44
			1½, lap.....	66	55				1½, lap.....	66	55
			2, lap.....	67	57				2, lap.....	67	57
			2½ to 4, lap.....	69	60				2½ to 4, lap.....	69	60

Butt Weld, extra strong, plain ends.						Butt Weld, extra strong, plain ends.					
¾, 1 and 1½	68	57½	¾	64	53	¾, 1 and 1½	68	57½	¾	64	53
1½	73	66½	1½	68	61	1½	73	66½	1½	68	61
¾ to 1½	77	70½	¾ to 1½	72	63	¾ to 1½	77	70½	¾ to 1½	72	63
2 to 3	78	71½	2 and 2½	73	64	2 to 3	78	71½	2 and 2½	73	64

Lap Weld, extra strong, plain ends.						Lap Weld, extra strong, plain ends.					
2	74	65½	1½	66	60	2	74	65½	1½	66	60
2½ to 4	76	67½	2	67	59	2½ to 4	76	67½	2	67	59
4½ to 6	75	66½	2½ to 4	71	62	4½ to 6	75	66½	2½ to 4	71	62
7 to 8	68	57½	4½ to 6	70	61	7 to 8	68	57½	4½ to 6	70	61
9 to 12	63	52½	7 and 8	64	54	9 to 12	63	52½	7 and 8	64	54
			9 to 12	59	48				9 to 12	59	48

Butt Weld, double extra strong, plain ends.						Butt Weld, double extra strong, plain ends.					
¾	63	56½	¾	58	50	¾	63	56½	¾	58	50
¾ to 1½	66	59½	¾ to 1½	61	53	¾ to 1½	66	59½	¾ to 1½	61	53
2 to 2½	68	61½	2 to 2½	63	55	2 to 2½	68	61½	2 to 2½	63	55

Lap Weld, double extra strong, plain ends.						Lap Weld, double extra strong, plain ends.					
2	64	57½	2	56	50	2	64	57½	2	56	50
2½ to 4	66	59½	2½ to 4	61	55	2½ to 4	66	59½	2½ to 4	61	55
4½ to 6	65	58½	4½ to 6	60	54	4½ to 6	65	58½	4½ to 6	60	54
7 to 8	58	47½	7 to 8	53	43	7 to 8	58	47½	7 to 8	53	43

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads on lap-welded steel, in effect from February 1, 1913, and standard charcoal-iron boiler tubes, in effect from January 1, 1913, are as follows:

Lap-Welded Steel.		Standard Charcoal Iron.	
1½ and 2 in.....	60	1½ in.....	44
2½	57	1½ and 2 in.....	48
2½ and 2¾ in.....	63	2½ in.....	44
3 and 3¼ in.....	68	2½ to 2¾ in.....	53
3½ to 4½ in.....	70	3 and 3¼ in.....	55
5 and 6 in.....	63	3½ to 4½ in.....	58
7 to 13 in.....	60	Locomotive and steamship special grades bring higher prices.	

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets.		Cents per lb.	
Nos. 3 to 8.....		1.70	
Nos. 9 and 10.....		1.75	
Nos. 11 and 12.....		1.80	
Nos. 13 and 14.....		1.85	
Nos. 15 and 16.....		1.95	

Box Annealed Sheets, Cold Rolled.		Cents per lb.	
Nos. 10 and 11.....		2.00	
No. 12.....		2.00	
Nos. 13 and 14.....		2.05	
Nos. 15 and 16.....		2.10	
Nos. 17 to 21.....		2.15	
Nos. 22 and 24.....		2.20	
Nos. 25 and 26.....		2.25	
No. 27.....		2.30	
No. 28.....		2.35	
No. 29.....		2.40	
No. 30.....		2.50	

Galvanized Sheets of Black Sheet Gauge.

	Cents per lb.
Nos. 10 and 11	2.50
No. 12	2.60
Nos. 13 and 14	2.60
Nos. 15 and 16	2.75
Nos. 17 to 21	2.90
Nos. 22 and 24	3.05
Nos. 25 and 26	3.20
No. 27	3.35
No. 28	3.50
No. 29	3.65
No. 30	3.80

Pittsburgh

PITTSBURGH, PA., April 8, 1913.

Operating conditions among the blast furnaces, steel works and finishing mills in the Pittsburgh district, Mahoning and Shenango valleys and the Wheeling district are almost back to normal again. It is expected that by April 20 the plants affected by the flood will be making their usual output. The daily press has greatly exaggerated the damage, particularly the losses by railroads. Instead of the New York Central, through its Pittsburgh & Lake Erie branch, losing 28 bridges, it has possibly lost three small ones. The Pennsylvania Lines West, instead of losing about 20 bridges, and needing 30,000 tons of structural material to replace them, has bought 1400 tons and will probably need 2000 tons more, to cover all bridges destroyed and damaged. The Carnegie Steel Company and the Jones & Laughlin Steel Company are giving preference to orders for plates and structural steel when it is proved that the material is wanted for repair work in the flooded districts. It is the belief that the flood will create a considerable demand for materials going into construction, such as nails, corrugated sheets, spikes and other products, but the amount that will thus be required has been much overestimated and deliveries will run for a long time ahead. The tariff bill presented on Monday is the chief topic of discussion in steel circles here. The opinion is that if the bill be passed in its present form it will not seriously disturb conditions in the local trade this year at least, but will probably be felt early next year. It is generally condemned by the steel interests, as the cuts proposed are regarded as too radical. Steel mills continue to report specifications in excess of actual shipments, one leading company stating that its specifications in March were 21 per cent. heavier than its shipments, and this particular company was not seriously affected by the flood. The tone of the market is stronger than it was before the flood. The coke and scrap markets are still somewhat demoralized. Owing to a heavy surplus of coke loaded on cars, prices for prompt delivery have severely declined.

Pig Iron.—The average price of Bessemer iron in March is given by W. P. Snyder & Co. as \$17.25, and of basic as \$16.059 at Valley furnace, to which 90c. should be added for delivery in the Pittsburgh district. New inquiry for pig iron since the flood has been quiet, but a healthy buying movement in both Bessemer and basic is looked for before this month is out. The Colonial Steel Company of this city is in the market for 1500 tons of basic each for May and June. The Westinghouse Air Brake Company will likely close soon for 2000 to 4000 tons of No. 2 foundry for delivery at Wilmerding, Pa., during second quarter. The Westinghouse Machine Company bought 1000 tons of foundry for delivery at Buffalo, N. Y., and the American Steel Foundries still has inquiries out for basic and foundry iron for delivery at its Alliance and Sharon works. A sale of 1500 tons of standard Bessemer iron was made to the Union Steel Casting Company of this city, equal deliveries April, May and June, at \$17.10 Valley furnace, or \$18 delivered, Pittsburgh. A sale was also made of 300 tons of Bessemer iron, sulphur running under 0.03 for prompt delivery at \$17.25 at Valley furnace. Malleable Bessemer and No. 2 foundry have declined squarely to \$16, Valley furnace, and are none too strong at this price. We quote standard Bessemer iron at \$17 to \$17.25; malleable Bessemer, \$16 to \$16.25; basic, \$16; No. 2 foundry, \$16 to \$16.25; gray forge, \$15.75 to \$15.85, all f.o.b. cars Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—All the steel plants in the New Castle, Sharon and Youngstown districts that were affected by the flood are again in operation, but some are not yet running full. The last to get started was the Sharon Steel Hoop Company, whose plant was down for about two weeks. The Republic Iron & Steel

Company put in one open-hearth furnace on Tuesday of this week and expects to start others quickly. Its entire plant of eight 60-ton furnaces will probably be running full early next week. One of the Youngstown interests that is building an open-hearth plant has recently sold a considerable tonnage of sheet bars to independent sheet and tin plate mills for delivery in second quarter, or as soon as the works get started, on the basis of about \$28, Youngstown. There are still considerable delays in getting steel from the mills to the finishing plants. For reasonably prompt delivery we quote: Bessemer billets, \$28.50 to \$29; Bessemer sheet bars, \$29 to \$29.50; open-hearth billets, \$29 to \$29.50, and open-hearth sheet bars, \$29.50 to \$30, f.o.b. mill, Pittsburgh or Youngstown. Forging billets, \$36 to \$37, and axle billets, \$34 to \$35, Pittsburgh.

Ferroalloys.—Commencing April 11, the Baltimore & Ohio Railroad will make rates on imported ferromanganese of \$2 from Baltimore, \$2.10 from Philadelphia and \$2.30 from New York to plants in the Pittsburgh district that it reaches directly. Plants not directly connected with the road will likely have to pay a switching charge. The Western Maryland has already announced that it will meet these rates and the Pennsylvania Railroad will no doubt do so. The cut of \$4 a ton in prices of English and German ferromanganese has scared prospective buyers off, and practically no new business has been placed since. A consumer that was inquiring for 500 tons for last half delivery has withdrawn from the market, believing the price will go lower. Sales of two cars, or about 60 tons, of ferromanganese for prompt shipment are reported at \$61, and a carload of 50 per cent. ferrosilicon for prompt delivery at \$75 delivered. We quote 80 per cent. English ferromanganese at \$61 seaboard, but on a firm offer this price might be shaded. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at \$75; over 100 tons to 600 tons, \$74; over 600 tons, \$73, Pittsburgh. We quote 10 per cent. at \$24; 11 per cent., \$25; 12 per cent., \$26, f.o.b. cars at furnace, Jackson, Ohio, or Ashland, Ky. We quote ferrotitanium at 8c. per pound in carloads; 10c. in 2000-lb. lots and over and 12½c. in lots up to 2000 lb.

Wire Rods.—The new demand is quiet, as most consumers are covered ahead. Specifications are fairly satisfactory. A sale of 500 tons of 25 per cent. Bessemer and 75 per cent. open hearth has been made for delivery in second quarter at \$30, Pittsburgh. We quote Bessemer, open-hearth and chain rods at that figure.

Muck Bar.—The market is quiet, but prices are firm. Two puddling plants in the Pittsburgh district, one at Girard, one at Youngstown, one at Wheeling and one at Kittanning, were off from 4 to 10 days on account of the flood, and this has created a decided scarcity. We quote best grades of local muck bar made from all pig iron at \$32 Pittsburgh, the quotation of \$33 last week having been a typographical error. It is stated on authority that the Eastern muck bar being offered in this city at \$28 delivered is made partly from scrap and that standard grades of Eastern bar are bringing \$30 or higher, Pittsburgh.

Skelp.—On a recent inquiry for 1500 tons of grooved steel skelp for prompt delivery, the highest price quoted was 1.45c. and the business was not placed. The skelp mills are pretty well filled through second quarter. We quote grooved skelp at 1.45c. to 1.50c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c.; sheared iron skelp, 1.85c. to 1.90c., delivered at buyers' mills in the Pittsburgh district.

Steel Rails.—Reports that the Carnegie Steel Company had received heavy orders for steel rails for replacement work on account of damage done by the flood are untrue; it has not received a single order of this kind, but some of the railroads have asked to have shipments anticipate against contracts placed some time ago, and as far as possible this is being done. The company is sold up on open-hearth standard section rails to August, on standard Bessemer rails to July, and on splice bars to August. The new demand for light rails is active, the same company having received in the past week new orders and specifications for about 2200 tons. We quote splice bars at 1.50c. per lb. and standard section rails at 1.25c. per lb. Light rails are quoted as follows: 25, 30, 35, 40 and 45 lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14 lb., 1.35c., and 8 and 10 lb., 1.40c., all in carload lots f.o.b. Pittsburgh.

Structural Material.—The American Bridge Company has taken contracts from the Baltimore & Ohio

Railroad for a new bridge at Coshocton, Ohio, 1500 tons, and a new bridge at Zanesville and one at Ellis, Ohio, both taking about 1500 tons. The same company has taken 800 tons of bridge work for the Montour Railroad, a branch line of the Pittsburgh & Lake Erie in this city, also 500 tons for viaducts and girder spans for a Western railroad and three small bridges for the Pennsylvania Railroad, about 250 tons. The McClintic-Marshall Construction Company has taken a bridge for the Baltimore & Ohio Railroad, 500 tons, to replace one destroyed, and 300 tons of bridge work for the Western Maryland Railroad, but the latter is not replacement work. The Jones & Laughlin Steel Company has taken an extension to a boiler and tank house for the Buffalo, Rochester & Pittsburgh Railroad at Du Bois, Pa., about 250 tons. The Pittsburgh Bridge & Iron Works has taken 1000 tons for new steel buildings, including foundry, machine shop, core building and pattern storage building, for the Erie Malleable Iron Company, Erie, Pa. The most important local contract placed in the week was that given to the Bethlehem Steel Company for 8000 tons for the new 12-story department store of the Kaufmann-Baer Company in this city. A good part of this steel will be Bethlehem shapes, and it will all be fabricated by the McClintic-Marshall Construction Company, the Thompson-Starrett Company having the general contract for the building. The steel work is to start June 15 and to be completed by August 1, or in six weeks' time, so that remarkably fast deliveries will have to be made on the steel. It is stated that some bridge work for replacements is under way and is expected to be given out during this month. We quote beams and channels up to 15 in. at 1.45c. to 1.50c. for delivery at convenience of the mill, which would be second half of this year, while small lots from warehouse for prompt delivery are bringing from 1.60c. up to 2c., depending on the size of the order and the deliveries wanted.

Iron and Steel Bars.—Local steel bar mills report active inquiries coming in from the implement trade for delivery during the year commencing July 1, and some fair-sized contracts have been placed. The Carnegie, Jones & Laughlin and Republic companies have all taken some of this business, but the heavy contracting has not yet been done. With the smaller consumers the steel bar mills are refusing to book orders for delivery further ahead than December next. Specifications against contracts still continue heavy, and leading makers state that specifications in March were slightly in excess of shipments. The new demand for iron bars is also active, several mills having their output under contract to July 1 or longer. Shipments have been seriously retarded by the flood. We quote merchant steel bars at 1.40c. to 1.45c. for delivery at convenience of the mill, which would not be before third quarter, while for shipment from warehouses 1.90c. to 2c. is quoted. We quote iron bars at 1.70c. to 1.75c. for reasonably prompt delivery. Mills charge \$1 extra per ton for twisting 3/4-in. and larger steel bars and \$2 extra for 1/2 to 5/8 in.

Sheets.—Most of the sheet mills in the Pittsburgh and Valley districts are again in practically full operation. A few that are still idle will be for a week or two. This is not altogether due to damage by the flood but to the fact that some of them have not been able to get steel. The American Sheet & Tin Plate Company is operating 69 per cent. of its hot sheet mill capacity and expects to increase this as soon as deliveries of steel are better. The entrance of two new sheet mills into the market as active sellers disturbed prices to some extent for a time, but it is now stated that they have sold quite a heavy tonnage and the tone of the market is stronger. It is claimed that 50,000 tons of sheets will be the loss in output, but this is probably exaggerated. A very heavy demand is felt for corrugated sheets, and it is said that some mills are back in deliveries 10 to 12 weeks. Specifications against contracts are active, one leading mill reporting that its specifications in March were 12 per cent. heavier than its shipments. We quote 1.75c. for No. 10 blue annealed; 2.35c. for No. 28 Bessemer black sheets; 3.50c. for No. 28 galvanized, and 2.30c. for No. 28 tin mill black plate. These prices are f.o.b. Pittsburgh, in carload and larger lots, jobbers charging the usual advances for small lots from store.

Plates.—Orders for steel cars in the past two weeks have been light. The Chicago, Peoria & St. Louis Railroad has placed 200 box cars with steel underframes with the American Car & Foundry Company. The supply of plates for prompt delivery is getting better and premiums are gradually declining. We quote 1/4-in. and heavier tank plate at 1.45c., Pittsburgh, for forward delivery, while for shipment in three or four

weeks 1.60c. to 1.65c. is quoted for carload and larger lots, and from 1.75c. to as high as 2c. for small lots, f.o.b. Pittsburgh.

Tin Plate.—Rapid progress is being made in getting the mills started that were shut down by the flood. The American Sheet & Tin Plate Company is now operating 87 per cent. of its hot tin mill capacity. Its American Works, Elwood, Ind., with 28 hot mills, was idle for about a week waiting for steel and coal, but was started up April 8. Reports as to how specifications are coming in on season contracts are somewhat conflicting, some stating that they are active, while others say they are only fairly satisfactory. There is no doubt, however, that the flood has stimulated specifications to some extent, as consumers fear if they hold off too long there may be delays in deliveries when they come to need tin plate. The Phillips Sheet & Tin Plate Company expects to start part of its plant at Weirton, W. Va., that was closed on account of the accident to its power house in April and will probably have the entire plant running not later than May 15. The shortage in supply of steel is worse now than it has been at any time, but this is only temporary. We quote 100-lb. cokes at \$3.60; 100-lb. ternes at \$3.45, and No. 28 black plate at \$2.30, all f.o.b. Pittsburgh.

Hoops and Bands.—Heavy contracts for both hoops and bands are being placed for third quarter delivery. Most contracts expire June 30 and the new ones are being made for third quarter delivery only, the mills refusing to sell as far ahead as fourth quarter. The plant of the Sharon Steel Hoop Company, which lost about two weeks' time, is expected to be in full operation again before this week is out. We quote steel hoops at 1.60c. to 1.65c. and steel bands at 1.40c. to 1.45c., extras on the latter as per the steel bar card, these prices being for delivery at convenience of the mill. For prompt shipment premiums are being paid.

Bolts and Rivets.—The new demand is only fair, as consumers are pretty well covered through second quarter and into third quarter. Premiums for prompt delivery have about disappeared, but it is stated that regular prices for forward shipments are being maintained. We quote button-head structural rivets at \$2.20 and cone-head boiler rivets at \$2.30 per 100 lb. The discounts on bolts are as follows, in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	80 and 10% off
Small carriage bolts, cut threads.....	75 and 5% off
Small carriage bolts, rolled threads.....	75 and 10% off
Large carriage bolts	70% off
Small machine bolts, cut threads.....	75 and 10% off
Small machine bolts, rolled threads.....	75, 10 and 5% off
Large machine bolts	70 and 7% off
Machine bolts with C.P.C. and T nuts, small.....	75 and 5% off
Machine bolts with C.P.C. and T nuts, large.....	70% off
Square hot pressed nuts, blanked and tapped.....	\$5.70 off list
Hexagon nuts	\$6.30 off list
C.P.C. and R. square nuts, tapped and blank.....	\$5.70 off list
Hexagon nuts, 3/4 and larger	\$6.60 off list
Hexagon nuts smaller than 3/4	\$7.20 off list
C.P. plain square nuts	\$5.20 off list
C.P. plain hexagon nuts	\$5.50 off list
Semi-finished hexagon nuts 3/4 and larger.....	85% off
Semi-finished hex. nuts smaller than 3/4.....	85 and 10% off
Rivets, 7/16 x 6 1/2, smaller and shorter.....	75, 10 and 10% off
Rivets, metallic tinned, bulk.....	3 1/2c. per lb. net extra
Rivets, tin plated, bulk.....	1 1/2c. per lb. net extra
Rivets, metallic tinned, packages.....	70, 10 and 10% off

Wire Products.—The mills report that little new business has been placed since the late advance of \$1 a ton in wire products, as consumers had previously covered ahead. Specifications are coming in at a fairly satisfactory rate. Two leading makers announce that all unspecified tonnage on contracts for wire nails at the \$1.70 basis and plain wire on the \$1.50 basis will be cancelled April 10. The output of wire products was not seriously affected by the flood, the Farrell works of the American Steel & Wire Company, closed for four or five days, being again in full operation. The wire drawing department at the Aliquippa works of the Jones & Laughlin Steel Company, lost only two turns, but the wire rod and wire mills of the Youngstown Sheet & Tube Company lost about a week. We quote makers' prices to jobbers as follows: Wire nails, \$1.80 base, per keg; cut nails, \$1.70 to \$1.75; galvanized barb wire, \$2.20 per 100 lb.; painted, \$1.80; annealed fence wire, \$1.60, and galvanized fence wire, \$2, f.o.b. Pittsburgh, usual terms, freight added to point of delivery. Jobbers charge the usual advances over these prices for small lots from store.

Railroad Spikes.—Some small hurry orders for railroad spikes for repair work have been placed, on which the makers are giving preference in shipment, and some of the railroads are urging shipments against contracts which makers are giving them as far as possible. Railroads are specifying freely, and there is a continued

scarcity in supply of small spikes. We quote railroad spikes in base sizes, $5\frac{1}{2} \times 9/16$ in., on large contracts with the railroads, at \$1.80, while for carload lots \$1.90 is charged; small railroad and boat spikes, \$1.90 to \$2 per 100 lb., f.o.b. Pittsburgh, for forward delivery.

Shafting.—Implement makers are in the market with inquiries for delivery running over six months and a year from July 1, and considerable tonnage has already been placed. Specifications against contracts are still coming in freely, and the shafting makers have their output pretty well sold through second quarter and have a good deal of business on their books for third and fourth quarter. We quote cold-rolled shafting at 58 per cent. off in carload lots, and 53 per cent. in small lots delivered in base territory, the usual slight differential over these discounts being allowed to the very largest consumers.

Merchant Steel.—The mills affected by the flood are pretty well straightened up again, and while not running to full capacity expect to be doing so within the next 10 days. In spite of the flood, March shipments were heavier than February. Prices are firm and we quote: Iron finished tire, $1\frac{1}{2} \times \frac{1}{2}$ in. and larger, 1.40c. to 1.55c.; base; under $1\frac{1}{2} \times \frac{1}{2}$ in., 1.55c. to 1.65c.; planished tire, 1.60c. to 1.70c.; channel tire, $\frac{3}{4}$ to $\frac{7}{8}$ and 1 in., 1.90c. to 2c.; $1\frac{1}{2}$ in. and larger, 1.80c. to 1.90c.; toe calk, 2c. to 2.10c.; base; flat sleigh shoe, 1.50c. to 1.65c.; concave and convex, 1.80c. to 1.90c.; cutter shoe, tapered or bent, 2.30c. to 2.40c.; spring steel, 2c. to 2.10c.; machinery steel, smooth finish, 1.80c. to 1.85c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and $1\frac{1}{2}$ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.30c.; soft, 3.55c.; coils, hard, 3.20c.; soft, 3.45c.; freight allowed. The usual differentials apply for lighter gauges and sizes.

Iron and Steel Scrap.—There is no improvement in demand or prices. The market is almost stagnant. Dealers figure, however, that some consumers have their stocks pretty well depleted and a buying movement is looked for before this month is out. The amount of scrap that will be available on account of the flood from wrecked bridges and building, it is stated, will be much less than given in the daily press. We note a sale of 2000 tons of selected heavy steel scrap to a local consumer at \$14.50 delivered and 2000 tons of borings at \$8.75 delivered. The consumer that bought these borings was offered other lots at this price, but declined them. We quote, per gross ton, delivered in the Pittsburgh and nearby districts as follows:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	\$14.25 to \$14.50
No. 1 foundry cast	14.25 to 14.50
No. 2 foundry cast	13.25 to 13.75
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	16.25 to 16.50
No. 1 railroad malleable stock	13.50 to 13.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.50 to 16.75
Iron car axles	24.25 to 24.75
Steel car axles	17.75 to 18.00
Locomotive axles, steel	21.75 to 22.00
Locomotive axles, iron	26.00 to 26.25
No. 1 busheling scrap	13.25 to 13.50
No. 2 busheling scrap	9.50 to 9.75
Old carwheels	15.75 to 16.00
*Machine shop turnings	10.25 to 10.50
*Cast-iron borings	8.50 to 8.75
†Steel bar crop ends	16.00 to 16.25
Old iron rails	16.25 to 16.50
No. 1 railroad wrought scrap	16.00 to 16.25
Heavy steel axle turnings	12.50 to 12.75
Stove plate	10.25 to 10.50

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

†Shipping point.

Merchant Pipe.—An inquiry is in the market for 112 miles of 20-in. pipe, but its source cannot be given, as the right of way for the gas line has not been secured. The Philadelphia Company of this city is inquiring for 30 miles of 16-inch and 15 miles of 12-inch steel pipe and the contract is likely to be placed this week. The mills are getting many small contracts for merchant and line pipe, but no long lines have been placed for several weeks. The demand for oil country goods is exceedingly heavy, and all the mills are back in deliveries 8 to 10 weeks or longer. All the pipe mills affected by the flood are again in full operation, the Riverside works of the National Tube Company going on in full on Tuesday last. It is stated that discounts on both iron and steel pipe are being firmly held.

Boiler Tubes.—The new demand for locomotive tubes is extraordinarily heavy, one leading maker stating that its entire output is sold up to October. The demand for seamless tubing has been strong for

months, and one maker has practically sold all it can make over the rest of this year. Discounts on iron and steel tubes are reported as being firmly held.

Coke.—The railroads hauling coke to the furnaces in the Mahoning and Shenango valleys are rapidly getting back to normal conditions and there is not now much delay in making deliveries. When the flood came all the blast furnaces had considerable coke stored in the yards and on the track, and with the shut down of so many for periods ranging from four days to a week or longer, there was naturally a glut in the supply. A number of furnaces have been holding up shipments until they could work off the coke on hand. This has resulted in a good deal being offered for sale for prompt delivery and prices have declined. We quote best grades of furnace coke for prompt delivery at \$2 to \$2.25 at oven, sales of 5000 to 6000 tons being reported at the prices named. On contracts for delivery over the remainder of the year standard grades of furnace coke are offered at \$2.25 at oven. The best grades of 72-hour foundry coke for prompt delivery are held at \$3 to \$3.50 per net ton at oven, while some grades not so well known are being offered at \$2.50 to \$2.75. A large number of ovens were put out in the Connellsville regions and there has been a sharp decline in output. The Connellsville Courier gives the total output of the Upper and Lower Connellsville regions last week as 353,933 net tons, a decrease over the previous week of 76,952 tons.

Chicago

CHICAGO, ILL., April 9, 1913.—(By Telegraph.)

Pig Iron.—With the coke situation assuming a less critical aspect, local furnaces are again seeking enlightenment as to the course this market may be expected to take when an end shall come to the present situation of suspense, already surprisingly prolonged. Thus far the price of regular grades has been maintained with unusual uniformity in the face of an indifference on the part of melters much more stubborn than had been anticipated. That a part at least of this selling strength is based on the belief that the foundries are only putting off the inevitable day of buying is not to be doubted, particularly with reference to the makers of malleable castings. An inquiry for 5000 tons from a local malleable foundry for last half delivery, while sharply outlined against the background of other inquiries current, will hardly result in immediate buying unless it brings out quotations more favorable than are indicated by the apparent aspects of the situation. Iron from the South, obtainable for second quarter delivery, can be had at prices down to \$12.50, Birmingham, for No. 2. Furnace quotations for third quarter and last half indicate that open prices of \$13 will obtain. In general, the foundries do not appear to have large stocks in their yards, but are apparently well covered by contracts into the second quarter. Where contracts have run out a hand-to-mouth buying is the prevailing policy. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4....	\$18.00 to \$18.75
Northern coke foundry, No. 1.....	17.75 to 18.00
Northern coke foundry, No. 2.....	17.25 to 17.50
Northern coke foundry, No. 3.....	16.75 to 17.00
Southern coke, No. 1 foundry and No. 1 soft	17.35 to 17.85
Southern coke, No. 2 foundry and No. 2 soft	16.85 to 17.35
Southern coke, No. 3	16.35 to 16.85
Southern coke, No. 4	15.85 to 16.35
Southern gray forge	15.85 to 16.35
Southern mottled	15.85
Malleable Bessemer	17.25 to 17.50
Standard Bessemer	19.40 to 19.90
Basic	17.25 to 17.50
Jackson Co. and Kentucky silvery, 6 per cent.....	20.40
Jackson Co. and Kentucky silvery, 8 per cent.....	21.40
Jackson Co. and Kentucky silvery, 10 per cent.....	22.40

(By Mail)

A survey of the situation at those mills where operations have been affected by the floods shows that deliveries of material on order into this territory have been retarded about three weeks. Conditions with these mills and with the railroads running west from Pittsburgh are still such that promises concerning shipments are rather unreliable. Coke shipments, while not in sufficient quantity to restore the margin of safety, have materialized at delivery points from day to day in miscellaneous carload lots numerous enough to maintain operations on the same basis as a week ago. The southern Indiana and Illinois coal field situation is more serious than it has been, though not yet critical. First quarter reports regarding finished steel products will show

record breaking production and shipment and exceedingly heavy specifications. In some lines also there has been comparatively little falling off in new business, while from local warehouse stocks the sales have aggregated a tonnage never before reached in the corresponding period. Exceptionally heavy mill schedules are the programme for April. In current business a number of billet inquiries are noted. Several sales of small lots of rails have been made and a considerable tonnage of bars, apart from contract requirements, has been placed. Activity in scrap immediately about Chicago during the week was more general but traffic conditions were noticeably depressing in their influence on trading elsewhere.

Rails and Track Supplies.—An order for 7000 tons of rails for the Chicago & Alton placed with the local mill was the only one of note reported during the week. Track fastenings as well had little attention, most of the roads having contracted for their requirements. The weakness that has prevailed for some time in connection with spikes seems to have disappeared, and this situation is now on a par with that of similar products. We quote standard railroad spikes at 1.90c. to 2c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carload lots, Chicago; tie plates, \$33 to \$35 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c. Chicago.

Structural Material.—In new structural business the market is rather quiet for the time being. Bridge shops and fabricators generally appear to be carrying unusually heavy stocks, so heavy in fact as to be out of proportion in some instance to the volume of business they are doing. Prices for fabricated steel are being shaded in a manner indicating a desire to work off some of this steel. Plans for the building of the new Morrison Hotel in this city have finally been matured, and the contract for the steel, involving 4400 tons, has been awarded to the American Bridge Company. Other contracts placed during the week included 645 tons for the Washington Water Power Company's power house at Spokane placed with the same company, 319 tons for the American Can Company's new building at Joliet awarded to the Decatur Bridge Company, 496 tons for the Oakland, Cal., Trust & Savings Bank to the Pacific Rolling Mill Company, 292 tons for the Schipper-Block Building, Peoria, Ill., to the Noelke-Richards Iron Works, and 341 tons for Swift & Co. at South Omaha. For Chicago delivery, mill shipment, we continue to quote 1.63c. to 1.68c.

A temporary falling off in the volume of structural shapes moving from store has been succeeded by an activity in keeping with the generally heavy movement of steel from warehouse. We quote for delivery from jobbers' stocks on base sizes 2.05c.

Plates.—The Illinois Central Railroad has ordered from the American Car & Foundry company 1000 cars for fruit transportation and the St. Louis & San Francisco is in the market for 1000 box cars and 1000 gondolas. The general mill situation as regards plates is unchanged and we quote for Chicago delivery, 1.63c. to 1.68c.

From local warehouse stocks the demand for plates has been exceptionally heavy during the past 10 days. A partial explanation is thought to lie in the reaction from flood disturbances which have thrown an increased pressure upon the warehouses affecting nearly all finished lines. We quote from store, 2.05c.

Rivets and Bolts.—Mill conditions affecting the sale of rivets have not improved, and concessions continue. A steady demand for special bolts is noted, but contracting for regular requirements is light. We quote from mill as follows: Carriage bolts up to $\frac{3}{4}$ x 6 in., rolled thread, 75-10; cut thread, 75-5; larger sizes, 70-2 $\frac{1}{2}$; machine bolts up to $\frac{3}{4}$ x 4 in., rolled thread, 70-10-5; cut thread, 75-10; large size, 70-7 $\frac{1}{2}$; coach screws 80-10 hot pressed nuts, square head, \$5.70 off per cwt.; hexagon, \$6.30 off per cwt. Structural rivets, $\frac{3}{4}$ to $1\frac{1}{4}$ in., 2.38c., base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Out of store we quote for structural rivets, 2.70c., and for boiler rivets, 2.90c. Machine bolts up to $\frac{3}{4}$ x 4 in., 70-7 $\frac{1}{2}$; larger sizes, 65-5; carriage bolts up to $\frac{3}{4}$ x 6 in., 70-5; larger sizes, 65 off. Hot pressed nuts, square head, \$5.30, and hexagon, \$5.90 off per cwt.

Cast-Iron Pipe.—In contrast to the lack of pipe buying on this side of the border, the cities of the Canadian Northwest are contemplating improvements on a large scale. At Saginaw, Mich., an award of 150 to 400 tons was made to the Massillon Iron & Steel Company and at Rockford, Ill., 200 tons was let to the United States Cast Iron Pipe & Foundry Company. At Jackson, Mich., a contract for 300 tons is to be placed this week. We quote as follows per net ton,

Chicago: Water pipe, 4 in., \$30.50; 6 to 12 in., \$28.50; 16 in. and up, \$27.50, with \$1 extra for gas pipe.

Bars.—The very general character of orders for steel bars indicates widespread activity in all branches of industry using this product. Among bar-iron users the manufacturers of railroad equipment and the makers of bolts are particularly insistent in their delivery requirements. No new developments have transpired in agricultural implement contracting. We quote for mill shipment as follows: Bar iron, 1.57 $\frac{1}{2}$ c. to 1.62 $\frac{1}{2}$ c.; soft steel bars, 1.58c. to 1.65c.; hard steel bars, 1.60c. to 1.70c.; shafting in carloads, 58 per cent. off; less than carloads, 53 per cent. off.

From store the movement of bars continues to be very heavy. For delivery from store, we quote soft steel bars, 1.95c.; bar iron, 1.95c.; reinforcing bars, 1.95c. base with 5c. extra for twisting in sizes $\frac{3}{4}$ in. and over, and 7 $\frac{1}{2}$ c. extra for smaller sizes; shafting 51 per cent. off.

Old Material.—The local consumers of scrap have been in the market for various grades, buying more or less freely. Some users of heavy melting steel that have been out of the market for several months have been purchasers. Throughout Indiana and Illinois, on the contrary, dealers developed a decidedly conservative attitude, presumably awaiting some more definite indications of the effect which present disordered conditions will have. Interest attaches to the selling policy of the Atchison, Topeka & Santa Fé Railway, which is still holding its heavy accumulation of scrap, but is moving mixed scrap in carload lots as it comes in. This material is hardly in shape for disposition to any but yard dealers with facilities for sorting and preparing to grade. Other railroad offerings include 1200 tons from the Chicago, Milwaukee & St. Paul, 1000 tons from the Wabash and 100 tons from the Chicago, Peoria & St. Louis. Prices in a few instances show improvement, but for the most part are unchanged. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.

Old iron rails	16.25 to 16.75
Old steel rails, rerolling	14.75 to 15.25
Old steel rails, less than 3 ft.	14.00 to 14.50
Relaying rails, standard section, subject to inspection	24.00
Old carwheels	16.75 to 17.25
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00
Shoveling steel	12.50 to 12.75
Steel axle turnings	10.50 to 11.00

Per Net Ton.

Iron angles and splice bars	15.75 to 16.25
Iron arch bars and transoms	16.25 to 16.75
Steel angle bars	12.00 to 12.50
Iron car axles	21.50 to 22.00
Steel car axles	18.75 to 19.00
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.75 to 12.25
Cut forge	11.75 to 12.25
Steel knuckles and couplers	12.00 to 12.50
Steel springs	12.50 to 13.00
Locomotive tires, smooth	13.50 to 13.75
Machine shop turnings	7.75 to 8.25
Cast and mixed borings	6.75 to 7.25
No. 1 busheling	11.00 to 11.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.75 to 9.25
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.50 to 11.00
Railroad malleable	13.25 to 13.75
Agricultural malleable	11.50 to 12.00
Pipes and flues	9.50 to 10.00

Philadelphia

PHILADELPHIA, Pa., April 8, 1913.

Some demand has sprung up for crude steel to supply shortages caused by the Western floods. In finished materials the demand on Eastern mills on that account has not been large, although a number of orders have been placed for small bridges to replace those gone out. Eastern mills, as a rule, are able to make better deliveries and in some lines are not enforcing the recent premiums for early shipment. While foundry pig iron has been quiet, more activity has developed in low phosphorus iron, standard brands of which have receded to \$23.50 delivered here. The new Underwood tariff bill, with its numerous readjustments downward, is of interest to the trade, the general expression being that some hesitancy will result pending action on it. The demand for bars has been well maintained. Coke is somewhat stronger, due to the better movement to the West. Old material is a trifle easier; large consumers are now well supplied and in a number of instances have reduced offering prices.

Iron Ore.—Reports of sales of Spanish ore are not substantiated. Offerings have been made down to 7½c. per unit, without resulting in business. Freights from Mediterranean ports are lower, 8 shillings 6 pence being quoted. Several charters for cargoes to this port have been effected, but apply on sales made early in the year. While ore is being more freely offered, consumers show hesitancy in placing orders. Importations during the week include 22,150 tons from Cuba and 6000 tons from Sweden.

Pig Iron.—Foundry iron consumers are not placing orders with the freedom that was expected by producers. Many buyers who customarily purchase in good-sized lots are only taking small quantities covering immediate needs. The proportion of small lot business is greater, but makes a good aggregate. Prices of standard brands of eastern Pennsylvania No. 2 X are well maintained at \$17.75 to \$18 delivered in this vicinity, either for prompt or near future shipment. Cast-iron pipe makers have been less active buyers. Consumers are, however, still in the market and odd lot sales have been made at prices ranging from \$16.25 to \$16.50 delivered at Delaware River points. Some Virginia producers maintain quotations at \$15.50 furnace, for No. 2 X, but this applies only against small sales; resale iron still appears to be offered, being quoted down to \$15 at furnace and producers have declared their intention to meet that price on any desirable inquiry. Rolling mill forge iron is quiet, although more activity is expected at an early date; standard brands are quotable at about \$16.75 delivered in this district. Activity in steel-making grades has been confined to low phosphorus iron. One large buyer consuming about 2000 tons a month has made heavy purchases against second half requirements, paying for round lots \$23.50 delivered, for standard analysis iron. Small sales are still being made at \$24. A large producer of Lebanon Valley low phosphorus pig has sold an aggregate of about 5000 tons since the opening of the month, at \$20 at furnace, covering various deliveries. There has been no important fresh demand for basic pig, although a large consumer has been feeling the market and is expected to make purchases for third quarter or second half in the near future. While general pig-iron buying continues below expectations, producers hold current prices with comparative firmness. In eastern Pennsylvania stocks are expected to show a slight increase, although they are still far below normal. In Virginia stocks again declined in March, the leading producer showing the heaviest decrease. The following range of prices about represents the market for deliveries in buyers' yards in this vicinity:

Eastern Pennsylvania No. 2 X foundry....	\$17.75 to \$18.00
Eastern Pennsylvania No. 2 plain.....	17.50 to 17.75
Virginia, No. 2 X foundry.....	17.80 to 18.00
Virginia, No. 2 plain.....	17.55 to 17.75
Gray forge.....	16.75 to 17.00
Basic.....	17.00 to 17.25
Standard low phosphorus.....	23.50 to 24.00

Ferroalloys.—The demand for 80 per cent. ferromanganese, notwithstanding the reduction in price to \$61, seaboard, for either prompt or second half delivery, has been practically at a standstill. Several carload lots have been sold for prompt shipment at that price, while some sellers have shaded that quotation \$1 a ton. Importations of ferromanganese last week aggregated 405 tons. Odd carloads of furnace ferrosilicon have been sold at \$27.30 delivered, for 11 per cent. grade.

Billets.—Considerable demand for both rolling and forging billets has come from the West, where floods have interfered with the supply, and Eastern makers are taking care of as much of this business as they can. Specifications on contracts, together with current miscellaneous business, keep mills fully engaged and but little gain has been made on deliveries. The market is firm, with producers showing less disposition to enter heavy contracts for extended shipment. Basic open-hearth rolling billets are quoted at \$30 to \$32, delivered in this district, according to tonnage, while forging billets command \$36, minimum, for ordinary analysis specification.

Plates.—The demand continues good, although Eastern mills are gradually becoming able to make better deliveries. Specifications have been in good volume, but new business has been more confined to miscellaneous lots. Car, locomotive and bridge plates are in the best demand. While Eastern producers still obtain 1.75c. to 1.80c. delivered on miscellaneous business, quotations of 1.70c. have been made, and Western plates are available, although not for as good delivery, at 1.65c. here.

Structural Material.—Considerable bridge work has

been placed with Eastern fabricators for replacement of bridges which went out in the Western floods. The major portion of this business has been in small bridges, for which prompt delivery was required. Contracts for fabricated structural work develop slowly. Several large propositions recently estimated on will be refigured. The general contract for the Kenilworth Apartments, 2000 tons, has been awarded to Cramp & Co. Bids go in this week on several thousand tons of structural shapes for the new buildings of the Tin Decorating Company, Baltimore. Prices of plain structural shapes show considerable variation. On heavy shapes some makers now quote 1.65c. delivered, while others name from 1.70c. to 1.75c., dependent on condition of order books. On the smaller sizes, for which mills are comfortably fixed as to orders, prices are firmer at 1.75c. delivered. Western shapes are still quoted at 1.65c. here, although delivery is uncertain.

Sheets.—Business has been coming to Eastern mills more freely, and order books are again in satisfactory shape. Labor difficulties at a large Eastern plant have been adjusted and mills are again running full capacity. Western makers still find it hard to make satisfactory deliveries. Prices are strong, Western No. 10 blue annealed being quoted at 1.90c. delivered here, while Eastern mills, making smooth loose-rolled sheets obtain 2c. for reasonably early shipments.

Bars.—The demand for both iron and steel bars has been well maintained. In iron bars orders in moderate quantities have been in good volume and mill rolling schedules are comparatively well filled. Prices are maintained at 1.60c. at mill, minimum, equal to 1.67½c. delivered, although some producers readily obtain 1.77½c. delivered for the better grades of bars. Few contracts for steel bars have been entered, although specifications are heavy. Prices are firm at 1.55c. to 1.60c. delivered on contracts and 1.85c. for prompt shipment.

Coke.—With the disappearance of the accumulation of coke at the ovens and the freer movement to furnaces, which temporarily suspended during the floods, the market has resumed more normal conditions. Moderate sales of prompt furnace coke have been made at prices ranging from \$2 to \$2.30 at oven. Contract furnace coke is held around \$2.50 at oven. Small sales of foundry coke are being made at prices ranging from \$2.75 to \$3.50. The following range of quotations, per net ton, is named for deliveries in buyers' yards in this district:

Connellsville furnace coke	\$4.25 to \$4.75
Connellsville foundry coke	4.90 to 5.65
Mountain furnace coke	4.15 to 4.65
Mountain foundry coke	4.60 to 5.10

Old Material.—With several large consumers out of the market, who have recently been heavy buyers, the general tendency has been easier. Offers, as a rule, are about 50c. a ton under recent quotations. The volume of business moving has been smaller. Odd lots of No. 1 heavy melting steel have been sold at \$13.75 and \$13.50, delivered. Dealers, however, pay \$13.75 for steel to apply on higher price contracts, still in force. Old carwheels have been in better demand, particularly for export to Canada, at about \$15, seaboard. Little movement is reported in rolling mill grades. Turnings were heavily sold recently at \$10.75 and \$11, but mills now offer \$10.50 delivered. Machinery cast is weak. Quotations, while to a certain extent nominal, range about as follows, for delivery in buyers' yards in this district, covering eastern Pennsylvania and nearby points, taking a freight rate, varying from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel	\$13.50 to \$14.00
Old steel rails, rerolling (nominal).....	15.50 to 16.00
Low-phosphorus heavy melting steel scrap..	17.75 to 18.00
Old steel axles (nominal)	19.00 to 20.00
Old iron axles (nominal)	27.00 to 28.00
Old iron rails	18.25 to 18.75
Old carwheels	15.00 to 15.25
No. 1 railroad wrought	16.00 to 16.50
Wrought-iron pipe	13.00 to 13.50
No. 1 forge fire	12.00 to 12.50
No. 2 light iron (nominal)	7.00 to 7.50
No. 2 cut busheling	10.00 to 10.50
Wrought turnings	10.50 to 11.00
Cast borings	10.50 to 10.75
Machinery cast	14.00 to 14.50
Grate bars, railroad	10.50 to 11.00
Stove plate	10.50 to 11.00
Railroad malleable (nominal)	13.00 to 13.50

J. A. Wade and E. J. Wade have formed a copartnership under the name of Wade & Co., and will engage in the iron and steel scrap, by-products and residue business, with headquarters at 1331 Washington avenue, Philadelphia.

Cincinnati

CINCINNATI, OHIO, April 9, 1913.—(By Telegraph.)

The indomitable spirit of manufacturers and business men in the Central West is admirably shown by the determination to rehabilitate all plants damaged by the recent floods at the earliest possible moment. Up to the present time, there are no authentic reports that a factory of any kind in this district is either not already operating or not in the process of reconstruction. However, the damage was enormous, and outside help will be needed by a large number. As far as the blast furnace situation in southern Ohio is concerned, all were compelled to shut down, with the exception of the Wellston and Jisco furnaces, which operated on practically full time. The Star furnace at Jackson will blow in next week, after a several months' suspension for remodeling. Hanging Rock furnace at Ironton was so badly damaged by the overflow that it will have to be relined. It is also reported that Ashland was equally damaged, but that both will blow in again this month. By strenuous work Union furnace was saved and, although partly inundated, was able to resume operations yesterday. Lawrence was already out for relining, and will blow in shortly. Both Nellie and Ironton, of the Marting Iron & Steel Company, were not touched by the high water, but were out of commission several days for lack of coke.

Fig Iron.—In this immediate section there is practically no demand, and with the possible exception of the rolling mills, it will be probably 30 days before there will be any interest manifested in the market. There are several inquiries for foundry iron from Indiana and another from the same territory for 2500 tons of malleable to be shipped during the last half. A northern Ohio melter is understood to have closed for 2000 tons of Lake Superior charcoal for shipment within the next six months. The railroads are badly handicapped, but very few users of iron in this section are now in need of an additional supply. Southern prices have developed decided weakness, and No. 2 foundry is now obtainable at \$12.50, Birmingham basis, for the second quarter, although few furnaces are making this quotation. While Northern iron is soft, communication has been so restricted lately that it is not known definitely if the minimum spot price of \$16, Ironton, has been shaded. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft..	\$16.25 to \$16.75
Southern coke, No. 2 foundry and 2 soft..	15.75 to 16.25
Southern coke, No. 3 foundry	15.50 to 16.00
Southern, No. 4 foundry	15.25 to 15.75
Southern gray forge	15.00 to 15.50
Ohio silvery, 8 per cent. silicon.....	20.20 to 20.70
Southern Ohio coke, No. 1.....	17.70 to 18.20
Southern Ohio coke, No. 2.....	17.20 to 17.70
Southern Ohio coke, No. 3.....	16.95 to 17.20
Southern Ohio malleable Bessemer.....	17.20 to 17.45
Basic, Northern	17.20 to 17.70
Lake Superior charcoal	18.75 to 19.25
Standard Southern carwheel	27.25 to 27.75

(By Mail)

Coke.—Railroads announce that they will be able to handle coke shipments, for nearly all points, before the end of the present week, and this will relieve the situation in the Hanging Rock district. Both prompt and contract furnace coke is quoted from \$2.25 to \$2.75 per net ton at oven, and foundry coke at \$3 to \$3.75. These quotations are nominal for the Connellsville field, and as far as can be learned Wise County and Poca-hontas prices are about on the same level.

Finished Material.—The considerable number of bridges washed away has brought out a heavy demand for structural shapes. Several of the local warehouses were in the flooded district, and most of them made arrangements to deliver by boat on urgent orders, but as the railroads were not accepting outside shipments business was paralyzed all last week. Within 10 days, at the most, the local and nearby mills will be operating on full time, and doubtless there will then be no delays on shipments.

Old Material.—Practically nothing has been done here the past two weeks. No outgoing shipments were able to be made, and the temporary closing down of local foundries and other melters of scrap iron has not tended to strengthen the market. The minimum figures given below represent what dealers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton.

Bundled sheet scrap	\$10.25 to \$10.75
Old iron rails	13.75 to 14.25
Relaying rails, 50 lb. and up.....	20.75 to 21.25
Re-rolling steel rails	12.75 to 13.25
Melting steel rails	10.75 to 11.25
Old carwheels	12.50 to 13.00

Per Net Ton.

No. 1 railroad wrought	\$10.75 to \$11.25
Cast borings	6.50 to 7.00
Steel turnings	6.50 to 7.00
No. 1 cast scrap	10.50 to 11.00
Burnt scrap	7.75 to 8.25
Old iron axles	18.00 to 18.50
Locomotive tires (smooth inside) ..	11.75 to 12.25
Pipes and flues	7.25 to 7.75
Malleable and steel scrap	9.00 to 9.50
Railroad tank and sheet scrap	6.00 to 6.50

Birmingham

BIRMINGHAM, ALA., April 6, 1913.

Fig Iron.—While Alabama iron makers continue to feel relieved in that the price level has been kept from going below \$13, they are not booking any great business. Reported sales are mostly of the carload size and they are bringing from \$13 to \$13.50 with \$13.25 the usual small-lot specification. Consumers appear to be fairly well-provided for and in some instances stop orders on shipments have been received. The Alabama furnaces have not been affected by high waters and maximum production continues. Some look for business in the territory supplied by the middle western stacks which were put out of business by the floods, but others do not expect much in that direction. It is the belief that if a good buying movement set in the market would rally, but there are no evidences of such a movement. Stocks on yards in Alabama did not increase during March. While furnace yards became fuller, there was an equal outpouring of warrant iron. Some of the resale iron sold around and under \$13 has been on the yards since 1911 and has been charged storage of 5c. a ton per month. It is claimed that 10,000 tons of this iron sold in December and January had been on the warrant yards since September, 1909. It is understood that some Tennessee furnace interests have been endeavoring to dispose of the output for the rest of the year at \$13, but whether successful or not is not known. Silicon iron of the Clifton brand is being sold at \$14.25, with one stack in operation. A relief to the Alabama furnaces was the retirement of one concern from the field of competition with resale iron. One of the best posted men representing one of the largest concerns terms it a "\$13 market," that is \$13 for quick delivery and the iron makers holding out for \$13.50 for second half and reluctant to take orders for that period. Quotations for quick delivery and second half per gross ton f.o.b. furnaces are as follows:

No. 1 foundry and soft.....	\$13.50 to \$14.00
No. 2 foundry and soft.....	13.00 to 13.50
No. 3 foundry	12.50 to 13.00
No. 4 foundry	12.25 to 12.75
Gray forge	12.00 to 12.50
Basic	13.00 to 13.50
Charcoal	25.00 to 25.50

Coal and Coke.—The demand for coke, which has been continuously active for several months, is still brisk with prices ruling at \$3 to \$3.50 for furnace coke and \$3.50 to as high as \$4.25 for foundry per ton of 2000 lb., f.o.b. ovens. Shipments of Birmingham district furnace coke to Chattanooga at \$3 f.o.b. cars at oven are reported. The Mobile & Ohio railroad has placed an order for 100,000 tons of coal in the Birmingham district on account of high waters in western mines. Delayed shipments to New Orleans on account of high water have depleted stocks of steam and domestic coal there and Alabama mines are busy replenishing. The demand for domestic coal is falling off. The high-grade mines are operating on full turn, but the low-grade output is not so great.

Cast-Iron Pipe.—The water pipe concerns report a number of filling in orders for small amounts, considerable in the aggregate, but there is a dearth of large-sized business, as has been the case for some time. The factories, however, continue to operate on something like full time and stock is accumulating. Prices remain at \$23.50 for 4 in. and \$21.50 for 6 in. and upward, with \$1 added for gas pipe.

Old Material.—Movements from yards have been in small lots, with wrought and steel scrap in principal demand. There have been some further declines in prices involving actual transactions, especially in light cast grades. The business is considerably smaller in

volume than at this time a month ago and stocks on dealers' yards show an increase. Prices per gross ton of 2240 lb., f.o.b. cars at dealers' yards, are asked as follows:

Old iron axles	\$15.50 to \$16.00
Old steel axles	15.50 to 16.00
Old iron rails	13.50 to 14.00
No. 1 railroad wrought	12.50 to 13.50
No. 2 railroad wrought	10.50 to 11.50
No. 1 country wrought	10.00 to 10.50
No. 2 country wrought	9.00 to 9.50
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.50 to 11.00
Tram carwheels	11.00 to 11.50
Standard carwheels	12.50 to 13.00
Light cast and stove plates	9.00 to 9.50

Cleveland

CLEVELAND, OHIO, April 8, 1913.

Iron Ore.—Dock shipments have been light since the Ohio floods, owing to condition of railroad traffic. Shipments from Toledo to southern Ohio were entirely suspended for about two weeks owing to the fact that some lines in southern parts of the state were out of commission. In spite of the crippled condition of the railroads dock shipments in March were 146,000 tons larger than in March, 1912. Ore on docks April 1 amounted to 6,728,035 tons or about 300,000 tons less than on the same date last year. Lake navigation to Lake Superior will not open until April 15 or later. It is stated that ice crushers will be used to open the channel at the Soo if the ice is not broken by that date. The Pittsburgh Steamship Company has not yet fixed dates for starting its boats. There is no activity in the ore market. We quote, prices as follows: Old Range Bessemer, \$4.40; Mesaba Bessemer, \$4.15; Old Range non-Bessemer, \$3.60; Mesaba non-Bessemer, \$3.40.

Pig Iron.—The market is dull and weak. The reduction in production due to recent floods has not had the effect of stiffening up prices. No definite selling price has as yet been established for the last half. For early delivery lower prices are being quoted than in the previous few weeks. A Cleveland furnace is quoting No. 2 foundry at \$16 at furnace for early local delivery or about 50c. a ton under recent quotations. The same interest is reported to have sold 500 tons of No. 3 to a Crestline, Ohio, manufacturer for the last half at a price lower than \$15.50 No. 2 as a base. This business came in competition with both Valley and southern Ohio furnaces. Southern Ohio furnaces are making quotations of \$15.50 from this territory. While some Valley furnaces are still asking \$16.50 for No. 2 for the last half, \$16 is the general quotation, and one seller is shading this price to \$15.50 for early delivery. Eastern inquiry has improved materially. The cutting off of the supply from southern Ohio has resulted in a number of southern Indiana melters placing orders for Toledo iron for quick shipment. The Southern market is weak. No. 2 Southern is quoted by both Tennessee and Alabama furnaces at \$13, Birmingham, for last half and \$12.50 for the second quarter. For prompt shipment and the second quarter we quote, delivered Cleveland, as follows:

Bessemer	\$17.90 to \$18.00
Basic	16.75 to 17.00
Northern No. 2 foundry	16.25 to 16.50
Southern No. 2 foundry	16.85
Gray forge	16.00
Jackson County silvery, 8 per cent. silicon	20.55 to 21.55

Coke.—Shipments are better than a week ago, but some furnaces are still having trouble in getting fuel as needed. Local sellers are trying to dispose of 45 cars of coke on tracks in Cleveland shipped to a local furnace that went out of blast at \$2.25 at oven. We quote Standard Connellsville furnace coke at \$2.25 per net ton at oven for spot shipment and \$2.25 to \$2.50 for contract. There is no demand for foundry grades. Standard 72-hr. foundry coke is quoted at \$3 to \$3.50 for spot shipment and \$3.25 to \$3.50 for contract.

Finished Iron and Steel.—The demand which suffered a severe set-back at the time of the floods has improved, but business is still below the volume of a few weeks ago, this being largely due to unsettled conditions growing out of the flood and unsatisfactory railroad service. Transportation facilities are improving every day, but are still far from normal. Freight service has been re-established on practically all the railroads throughout the greater part of Ohio, with the exception of some of the smaller branches. The floods have already resulted in considerable demand on warehouses for structural material for quick bridge repair work. Railroads have asked the mills to help them out by giving early shipment on structural steel for bridge re-

placement purposes. Some of the mills have agreed to place such orders ahead of others on their books, and other mills are expected to adopt a similar policy. The floods have also resulted in a heavy volume of orders for spikes for track replacement purposes. Sheets are in good demand and the floods have put most of the mills behind on deliveries. It is claimed that the delay of some of the mills will amount to close to 30 days. There is a good demand for plates for early delivery. The local demand for forging billets is more active than for some time and an Eastern mill has advanced its minimum price \$1 a ton to \$34 at the mill. The structural situation is quiet although much work is in prospect. The Burger Iron Company, Akron, has taken 200 tons for a power plant extension for the Firestone Tire & Rubber Company in that city. The United States Cast Iron Pipe & Foundry Company has taken 1100 tons of water pipe for Akron. Bar iron prices are unchanged at 1.60c. to 1.65c., Cleveland. Stock prices are 2.10c. for steel bars and 2.25c. for plates and structural material.

Old Material.—The market is dull and prices are weak. Local mills are still fairly well supplied and are buying only in very limited quantities. The recent floods cut off scrap consumption, but had very little effect on production, so that there is an increase in the available supply. Because of flood conditions an embargo is in force at Portsmouth. One local consumer has asked that shipments be suspended for ten days. A Canton, Ohio, consumer is in the market for heavy melting steel for which it has offered \$14, delivered. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton.	
Old steel rails, rerolling	\$14.50 to \$15.00
Old iron rails	16.00 to 16.50
Steel car axles	18.75 to 19.25
Heavy melting steel	12.75 to 13.00
Old carwheels	15.00 to 15.50
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	11.75 to 12.00
Railroad malleable	13.50 to 14.00
Light bundled sheet scrap	10.00 to 10.50

Per Net Ton.	
Iron car axles	\$21.00 to \$21.50
Cast borings	7.50 to 8.00
Iron and steel turnings and drillings	6.00 to 6.25
Steel axle turnings	9.00 to 9.25
No. 1 busheling	11.50 to 12.00
No. 1 railroad wrought	13.25 to 13.50
No. 1 cast	12.50 to 13.00
Stove plate	9.00 to 9.50
Bundled tin scrap	11.00 to 11.50

The Republic Iron & Steel Company will move its Cleveland offices April 9 from the Citizens Building to 540-548 Leader-News Building.

H. Simon, scrap iron dealer, has moved his office from the Williamson Building to 428 Garfield Building, Cleveland, Ohio.

Buffalo

BUFFALO, N. Y., April 8, 1913.

Pig Iron.—There has been a marked increase in inquiry, exceeding that of any week of the past three or four months, and some good sized business has been placed. The aggregate of the week, covering all grades, is between 35,000 and 40,000 tons. The inquiry is pretty general from New York State points and territory tributary to this producing center. Melters are taking more interest in pig iron than at any time since last fall. Many consumers are getting to the end of their contract tonnages and becoming short of stock and it looks as though buyers have reached a point where they think it advisable to protect themselves for future needs. It appears quite probable that the market is on the threshold of a strong buying movement likely to develop within the next 30 days. Furnaces are so well sold ahead (most of them to the end of the second quarter and many to the end of the third quarter) that they are inclined to hold off a little longer before contracting. Prices show a slightly stronger tendency, but no quotable advance. The range on the various grades of foundry iron remains at \$16 to \$17. We quote as follows for second quarter and last half delivery, f.o.b. Buffalo:

No. 1 foundry	\$16.75 to \$17.00
No. 2 X foundry	16.50 to 17.00
No. 2 plain	16.25 to 16.75
No. 3 foundry	16.25 to 16.50
Gray forge	16.00 to 16.25
Malleable	17.00 to 17.25
Basic	17.50 to 18.00
Charcoal, regular brand and analysis	18.00 to 19.00
Charcoal, special brand and analysis	21.75

Finished Iron and Steel.—The various district sales offices representing the Pittsburgh and Youngstown

mills for this territory report that shipments are again being made at about normal volume and rate, but the stoppage of the mills and crippling of railroad facilities caused by the recent floods has caused a little further falling behind of delivery dates amounting to about 3 weeks in some instances. This seems to have stimulated specification, buyers recognizing that they cannot expect much in the way of better deliveries for some time to come. Some agencies report that specifications received for the month of March exceeded in volume those received in January or February. Users are now specifying freely for material they are going to use in the fourth quarter, most mills at this time being unable to accept tonnage for earlier delivery. A few agricultural implement manufacturers have come into the market to contract for tonnage for the year ending July 1, 1914, but find that the steel companies do not feel inclined to contract beyond January 1. Railroad track supplies are moving freely. Small spike deliveries are extended to about 15 weeks. There is also a large demand for reinforcing bars for concrete work. It is understood that Erie Barge Canal Contract No. 120, calling for 1500 tons of steel sheet piling, will be closed the coming week. So far, however, none of the mills has agreed to make delivery within the specified time. In fabricated structural material a larger tonnage is being figured on than mills can produce in addition to contracts already taken. Bids are being taken this week for an addition to the Manufacturers & Traders Bank building, Buffalo, requiring 250 tons and bids will soon be taken for several theatre buildings for which plans are completed or under way, taking 100 to 300 tons each. Plans are also in progress for an office building for the International Railway, this city, and for a sub-exchange building for the New York Telephone Company here, calling for about 200 tons each. The Buffalo Structural Steel Company has the contract for the Jubilee Theatre building, Buffalo, taking 100 tons.

Old Material.—The market remains quiet with very little activity in any line, as regards new business, and users are taking only small lots on old contracts. Dealers are disinclined to take on much business at present prices, however, believing that prices are likely to go to a slightly higher level very shortly. The current schedule remains practically the same as for last week. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	\$13.00 to \$13.75
Boiler plate, sheared	15.00 to 15.50
No. 1 busheling scrap	11.50 to 12.00
No. 2 busheling scrap	9.00 to 9.50
Low phosphorus steel	17.00 to 17.50
Old iron rails	15.00 to 15.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	17.50 to 18.00
Old iron axles	24.00 to 24.50
Old carwheels	15.00 to 15.50
Railroad malleable	13.25 to 13.75
Locomotive grate bars	10.50 to 11.00
Stove plate (net ton)	9.75 to 10.00
Wrought pipe	10.00 to 10.50
Wrought iron and soft steel turnings	7.75 to 8.25
Clean cast borings	7.50 to 8.00
Bundled tin scrap	17.00

Boston

BOSTON, MASS., April 8, 1913.

Old Material.—Reported improvements in demand for scrap from other sections are not reflected in this market, which continues to drag. Few sales of any moment have been made, and prices remain unchanged. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	\$11.50 to \$11.75
Low phosphorus steel	13.50 to 14.50
Old steel axles	14.50 to 15.00
Old iron axles	22.50 to 23.00
Mixed shafting	13.50 to 13.75
No. 1 wrought and soft steel	10.75 to 11.00
Skeleton (bundled)	9.00 to 9.50
Wrought-iron pipe	10.00 to 10.25
Cotton ties (bundled)	9.50 to 9.75
No. 2 light	4.00 to 4.50
Wrought turnings	7.50 to 7.75
Cast borings	7.50 to 7.75
Machinery, cast	13.50 to 14.00
Malleable	10.50 to 11.00
Stove plate	8.50 to 9.00
Grate bars	7.50 to 7.75
Cast-iron carwheels	15.00 to 15.50

German Trade Less Satisfactory

Pig Iron the Bright Spot—Exports Keep Up—Steel Bars Weak Feature

BERLIN, March 27, 1913.

The reserve of buyers, especially dealers, is commented on as one of the impressive features of the situation. It appears evident that manufacturers are exerting themselves more than hitherto to obtain orders—particularly in finished products. Even the lower prices now asked for basic bars and some other steel products have failed to stimulate buying. In view of this state of things a feeling of doubt about further developments is growing more manifest. Everybody is waiting impatiently to hear that a decisive step has been taken toward peace, after which a considerable revival of activity is looked for.

The ore market continues firm, though a slight hesitation is noted in some quarters since the mine-owners began selling for the second half-year at somewhat advanced prices. The furnaces, however, have very small stocks and are urgently calling for shipments on contract.

Pig iron remains firm in the fullest sense of the word. The Syndicate continues to receive supplementary orders for delivery in the next quarter, and finds difficulty to accommodate these, as it is sold out for the first half. Foreign markets also continue to send in orders, and some foreign business for the second half-year has already been booked. Further important orders from abroad are looked for, Belgium, in particular, having large requirements that have not yet been covered. The price schedule for the second half-year will be adopted next week, but no changes are expected in view of the uncertainties of the situation. It is not impossible, however, that small advances will be made in several of the highest grades, which are particularly scarce. Although the Syndicate runs till 1915, it is reported that the question of prolonging it till 1917 will be taken up at the next meeting.

This month is expected to show a new record in the shipments of the Steel Works Union, as the mills will be finishing up the orders of the year. It is regarded as probable that the shipments will exceed the remarkably heavy movement of last March. Work on rails is understood to be extremely active.

In semi-finished steel, consumers have for the most part placed orders for their requirements for the entire second quarter. Their orders are reported to be fully up to the previous level. Export business continues rather quieter, but specifications on existing foreign orders are coming in satisfactorily. In structural shapes dealers are very cautious in ordering for the June quarter, owing to the unsatisfactory position of the building trade. While foreign business has become quieter, it is still regarded as pretty good in view of all the circumstances. The export price for beams is about 115 marks f.o.b. Antwerp. There is some talk to the effect that the international pool intends to raise prices 1 or 2 marks.

While some of the steel bar mills will not sell at less than 122 to 124 marks for prompt delivery, others will take orders 4 to 6 marks below those figures. Certain dealers continue to sell short at lower than manufacturers' prices, on the speculation that they will be able to buy at a profit before having to make delivery. For iron bars the position is more favorable. The association in the latter has just adopted a scale of unchanged prices for the next quarter—148 marks for merchant bars, 153 for screw stock, 155 for horse-shoe bars, and 168 for rivet bars. Foreign sales are made at the same prices, or nearly so.

Considerable irregularity is noted in the plate trade. While heavy plates continue in a satisfactory position owing to the big orders in hand from shipbuilding yards and the prospect that these will continue to buy actively for months, the position of thin plates is pronouncedly weak. Foreign demand has become light, and in the chase after home orders the mills have cut prices 2 to 3 marks.

The tube market is evidently in a less satisfactory position. In gas pipe, in particular, it has grown apparent that prices are being cut; hence the association is adopting more rigorous measures to see that the agreement is adhered to. The export markets also show a quieter tone, so far as new orders are concerned.

Conditions in wire rods are still reported as normal. The wire mills have begun to place their orders for the second quarter and are taking about the usual amounts. Producers of wire nails still have enough work in hand to keep them busy, but new orders from foreign mar-

kets are obtained with growing difficulty. Prices are accordingly rather weak. For the home trade it is not easy now to get 14 marks per metric cwt.

Germany's exports of iron and steel in February showed a very satisfactory increase. They amounted to 501,754 metric tons. This was nearly 2000 tons more than for January, despite the shortness of the month, and it exceeded the movement for February, 1912, by 22,000 tons.

The Belgian market has sent in news of a further cut of one shilling on exports of heavy and thin plates and iron bars. Crude iron and steel remain firm.

British Market Still Dull

German Semi-finished Material Weak—

Standard Oil Buys 60,000 Boxes of Tin

(By Cable)

MIDDLESBROUGH, ENGLAND, April 9, 1913.

Manipulation in pig iron is disturbing all markets, but shorts are squaring off privately. Dullness in general prevails, but German semi-finished material is showing a weaker tendency with a probability of price reductions, as the Belgians and French are selling cheap.

The Standard Oil Company has bought 60,000 boxes of tinplates for America at a little below 14s. 3d. Stocks of warrant iron are 210,752 tons, against 213,679 tons one week ago. We quote as follows:

Cleveland pig-iron warrants (closing Tuesday), 65s. 6d., against 66s. 9d., one week ago.

No. 3 Cleveland pig-iron makers' price, f.o.b. Middlesbrough, 65s. 9d., against 67s. 3d., one week ago.

Ferromanganese, £11 12s. 3d. f.o.b. shipping port.

Steel sheet bars (Welsh) delivered at works in Swansea Valley, £5 10s., against £5 7s. 6d., one week ago.

German sheet bars, f.o.b. Antwerp, nominally 110s., a decline of 2s. 6d.

German 2-in. billets, f.o.b. Antwerp, nominally 105s., a decline of 2s. 6d.

German basic steel bars, f.o.b. Antwerp, £5 15s.

Steel bars, export, f.o.b. Clyde, £8.

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £7 7s. 6d.

German joists, f.o.b. Antwerp, £5 12s. to £5 15s.

Steel strip plates, Scotch, delivered local yards, £8 7s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 15s.

Steel rails, export, f.o.b. works port, £6 15s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 14s., against 13s. 10½d., one week ago, 14s. two weeks ago.

New York

NEW YORK, April 9, 1913.

Pig Iron.—There has been little buying by the average run of foundries, apart from small lots, but interest is shown in the market by a few, thus far very few, large consumers. One company that will want 18,000 to 20,000 tons for second half delivery to three plants—one in eastern Pennsylvania, one in New Jersey and one in western New York—is understood to have bought for the last-named plant about 4500 tons, the business going to Buffalo. It is expected that upward of 12,000 tons of No. 2X and No. 3 foundry will be closed soon for the other two plants. Some low prices, it is believed, were called out by this inquiry. A Hudson Valley foundry is in the market for several thousand tons for the second half. The way in which some of the large melters are sounding the market for second half indicates the effort commonly put forth by buyers of this class to get in at low point after a period of suspended buying. It is recognized by both buyers and sellers that the market is in a position where concessions are likely to be made, and at the same time that several considerable purchases might develop a turning point. Under these conditions the market will be watched very closely in the next few weeks. Rather more Canadian inquiry has come out recently, which is of direct interest to Buffalo furnaces. Prices at Buffalo show variations. It is evident that \$16 at furnace can be done for No. 2X foundry, though some sales have been made above this figure. At the same time business in sharply competitive territory might develop concessions. There is some irregularity in quotations recently made by

eastern Pennsylvania furnaces, and the question of the basis on which backlog business should be taken on for third quarter or second half is one to which furnace companies are giving serious consideration. We quote as follows for Northern iron at tidewater: No. 1 foundry, \$17.50 to \$18; No. 2X, \$17.25 to \$17.50; No. 2 plain, \$17 to \$17.25. Southern iron is quoted at \$17.75 to \$18 for No. 1 foundry and \$17.25 to \$17.75 for No. 2.

Structural Material.—The New York market is still very quiet and what activity there is in New York State and eastern Pennsylvania. It is felt that the influence of the floods will be to extend deliveries about one month, so far as general manufacturing buyers are concerned, for the reason that besides the stoppage of a week or 10 days of the finishing mills, preference will probably be made to railroads with the effect that the time will be doubled, totaling the four weeks suggested. It develops that much of the bridge replacement is at present taking the form of false work, in other words, the use of timber as a temporary expedient, so that many of the new bridges required by the railroads can take their turn and will probably involve work throughout the summer. It is growing increasingly apparent that local fabricators, besides finding closures infrequent, are commonly forced to consider work of an urgent character with the result that prices above the minimum have to be paid for the plain material. There is still a fair volume of small work making a good aggregate. Some of the recent contracts awarded are as follows: Lewis F. Shoemaker & Co. have been awarded 1000 tons for New York Central terminal work in New York, leaving still pending about 2000 to 2500 tons, including a late inquiry for 600 tons. The Keystone Structural Company has taken 2600 tons for an apartment house in Philadelphia; the Phoenix Bridge Company 360 tons for a bridge for the Pennsylvania in Maryland, and the McClintic-Marshall Construction Company 270 tons for the Montgomery street bridge, Philadelphia, and the 4500 tons for the Baer-Kaufmann store building, Pittsburgh, and the American Bridge Company 900 tons for the University of Pennsylvania surgical building, 900 tons for a public service electric lighting power house at Elmira, N. Y., and 600 tons for the Oneida Community at Sherrill, N. Y. Quotations for plain material are: 1.61c. to 1.66c., New York, for mill shipments in the third and fourth quarter; 1.76c., New York, for delivery in three to eight weeks, and for lots from store, 2.15c., New York.

Plates.—No change is noted, deliveries being obtainable in two or more weeks at the usual price of 1.60c., Pittsburgh. Buyer and seller have not yet come to terms on some large contracts with Eastern mills for the last half, similar to those taken six months ago at the 1.60c. base, the mill still holding out for the same figure. Car buying has been chiefly in passenger equipment and the 20 odd cars for the Atlantic Coast Line were divided between the Pullman Company and the American Car & Foundry Company; the Pressed Steel Car Company was awarded 10 postal cars for the Northern Pacific and the Boston Elevated has given 25 cars to the American Car & Foundry Company and 30 to the Pressed Steel Car Company. Quotations remain 1.61c. to 1.66c., New York, for mill shipment in the fourth quarter, and 1.76c. for shipment in three to four weeks.

Bars.—The steel bar market is very strong and there is some talk of the imminence of an advance in price. Prompt bars are getting more difficult to obtain and it is probable that four months is the earliest that any one size can be obtained at base prices with the majority procurable only in six to seven months. No change is noted in bar iron. There is a good run of orders and less is heard of weakness in bolts and nuts. Steel bars are quoted at 1.56c., New York, with future deliveries four or more months hence, while refined iron bars are held at 1.65c. to 1.75c., New York, although one maker, not actively seeking business, asks 1.80c. New York. Store prices for steel bars are 2.05c. and for iron bars, 2.10c.

Cast-Iron Pipe.—Considerable interest is being taken in the result of the competition for the contract for the extension of the New York City high-pressure fire protection system, on which bids are to be opened to-day, as the contract involves the purchase of 9000 tons of extra heavy cast-iron pipe by the successful bidder. Some small purchases have been made by municipalities in this territory within the past week, but the quantities involved were unimportant. Pipe manufacturers report a good general demand from private buyers. Prices on carload lots of 6-in. range from \$23.50 to \$25 per net ton, tidewater.

Old Material.—A moderate volume of business is reported by dealers, but apparently large consumers are

either well supplied or do not care to anticipate their requirements to any extent. While some reduction has been made in bids by consumers the market appears to be fairly firm, with dealers' quotations as follows, per gross ton, New York City and vicinity:

Old girder and T rails for melting.....	\$10.75 to \$11.25
Heavy melting steel scrap	10.75 to 11.25
Relaying rails	22.00 to 22.50
Rerolling rails (nominal)	14.00 to 14.50
Iron car axles	24.00 to 24.50
Old steel car axles	15.75 to 16.25
No. 1 railroad wrought	13.25 to 13.75
Wrought-iron track scrap	12.25 to 12.75
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.00 to 11.50
Light iron (nominal)	4.50 to 5.00
Cast borings	8.00 to 8.50
Wrought turnings	8.25 to 8.75
Wrought pipe	10.75 to 11.25
Old carwheels	14.50 to 15.00
No. 1 heavy cast, broken up.....	11.25 to 11.75
Stove plate	8.75 to 9.25
Locomotive grate bars	8.00 to 8.50
Malleable cast	11.00 to 11.50

Ferroalloys.—Practically no demand exists for 80 per cent. ferromanganese, the quotation for which is the same as fixed a week ago by the foreign producers, namely, \$61, Baltimore. The effect of the reduction from \$65 to \$61, which was inspired by the underselling of resale lots, was to cause the withdrawal of such inquiries as were before the trade. They amounted to but a few hundred tons. Sellers are almost unconcerned over the proposed change in the tariff which would impose a duty of 15 per cent. instead of the present rate of \$2.50 per ton. In the event of its adoption the ad valorem duty would make little difference to dealers, as contracts would be so drawn as to provide for variances. Ferrosilicon, 50 per cent., is moving quietly at \$75, Pittsburgh, for carloads \$74 for 100 tons, and \$73 for 600 tons and over. In both ferroalloys quoted the deliveries are heavy.

Metal Market

NEW YORK, April 9, 1913.

The Week's Prices

Copper, New York.		Tin.		Lead.		Spelter.	
April.	Lake.	Electrolytic.	New York.	New York.	St. Louis.	New York.	St. Louis.
3.....	15.50	15.25	47.45	4.35	4.20	5.90	5.75
4.....	15.62½	15.37½	47.75	4.35	4.20	5.90	5.75
5.....	15.62½	15.37½	.....	4.35	4.20	5.90	5.75
7.....	15.62½	15.37½	48.10	4.35	4.20	5.90	5.75
8.....	15.62½	15.37½	48.15	4.35	4.20	5.90	5.75
9.....	15.62½	15.37½	48.25	4.35	4.20	5.90	5.75

Copper is higher. Tin is quiet and fairly steady. Lead maintains its price despite dullness. Spelter is inactive at unchanged prices. Antimony continues dull and uninteresting.

New York

Copper.—Buying kept up in good volume until Saturday when it became less active but by no means entirely subsided. On that day practically all of the sellers of electrolytic advanced prices ½c., leaving only two interests offering the metal at 15.37½c. cash, New York. The others asked 15.50c. cash, New York. Lake was so freely bought in the recent movement that little or none of it is to be had to-day, and the price quoted, 15.62½c., is entirely nominal. Diligent inquiries have failed to disclose where it can be obtained. Electrolytic is quoted at 15.37½c. to 15.50c. cash, New York. The report of the Copper Producers' Association for March, showing a reduction in stocks of over 18,000,000 lb. was made public yesterday, having the effect of strengthening the already strong tone. The main point of interest is the influence which the statement will have upon London prices, as advances there will be reflected here. On the part of consumers greater confidence is much in evidence and it has led not only to buying but to looking further ahead in the matter of supplies. Quotations in London to-day are £68 7s 6d for both spot and futures. Exports this month continue heavy and now total 7365 tons.

Tin.—Consumers have been leaving this market pretty severely alone and the limited business was mainly between dealers. This is a condition which was predicted and which might well have been expected in view of the record breaking deliveries into consumption in the month of March. Present indications are that despite the seeming lack of demand this month's supply will not be over large. Arrivals this month total 670 tons and there is afloat 1250 tons due to arrive in April, to which a few straggling lots probably will be added. So far as effects of any possible shortage are concerned,

they will be offset by the recent heavy deliveries. The price in New York to-day is 48.25c. and the London quotation for spot is £218 15s. and for futures is £215 5s.

Lead.—This metal maintains its price of 4.35c. New York, and 4.20c. St. Louis, despite a dull market. The announcement of the new tariff bill, which proposes to make the duty on imported lead 25 per cent. ad valorem, had little or no effect. It was quickly figured out that this percentage of duty added to existing prices would make the import cost of lead about 4.62½c. per lb. The one result of the new tariff, when operative, it was generally concluded, would simply be to prevent prices from soaring as they have done at times in the past.

Spelter.—In a dull market quotations are 5.90c. to 5.95c., New York, and 5.75c. to 5.80c. St. Louis. Demand was so thoroughly satisfied in the last buying movement that the utmost quiet prevails and a weaker tendency is shown, despite the fact that the recent floods have interfered with shipments from the smelters.

Antimony.—The market continues very dull, with quotations unchanged at 9c. for Cookson's, 8.50c. for Hallett's and 7.62½c. for Chinese and Hungarian grades. The proposed tariff change in antimony—from 1½c. per lb. to 10 per cent. ad valorem—is pronounced advantageous to consumers, inasmuch as little antimony is produced here. Unless the producers advanced their prices, which is regarded as rather improbable, the metal would cost less.

Old Metals.—With a more active copper market, dealers' selling prices have advanced and are now as follows:

	Cents per lb.
Copper, heavy and crucible	14.75 to 15.00
Copper, heavy and wire	14.50 to 14.75
Copper, light and bottoms	13.25 to 13.50
Brass, heavy	9.75 to 10.00
Brass, light	8.25 to 8.50
Heavy machine composition	13.25 to 13.50
Clean brass turnings	8.75 to 9.00
Composition turnings	11.50 to 12.50
Lead, heavy	4.00
Lead, tea	3.75
Zinc, scrap	5.25

Chicago

APRIL 7.—Both copper and tin quotations, responding to a more active market and a stronger tone, show advances from last week's prices. Spelter values continue to waver, and for large lots concessions are readily obtainable. We quote as follows: Casting copper, 15.50c.; Lake, 15.75c., in carloads for prompt shipment; small lots, ¼c. to ½c. higher; pig tin, carloads, 49c.; small lots, 51c.; lead, desilverized, 4.30c. to 4.35c. for 50-ton lots; corroding, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.90c.; Cookson's antimony, 10.50c., and other grades, 9.75c., in small lots; sheet zinc is \$8, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying price for less than carload lots: Copper wire, crucible shapes, 13c.; copper bottoms, 11.75c.; copper clips, 12.75c.; red brass, 12c.; yellow brass, 9c.; lead pipe, 3.80c.; zinc, 4.35c.; pewter, No. 1, 33c.; tinfoil, 39c.; block tin pipe, 44c.

European Industries Large Users of Oxygen

A. A. Heller, general manager International Oxygen Company, New York, recently returned from a trip abroad in the course of which he gave particular attention to European progress in the use of oxygen and hydrogen for welding and cutting. In an interview, he said:

"The applications of welding and cutting by oxygen and hydrogen or oxygen and acetylene are increasing abroad at a very rapid pace. Large establishments like railroad shops and armorplate, boiler and tube makers are using the oxyacetylene torch for one purpose or another more and more. At some of the large English and French establishments, such as John Brown and Cammel, Laird & Co., or Acieries St. Etienne, armorplate from 15 to 18 in. thick is being cut by oxyacetylene process with great saving. The railroad companies in France, such as the Chemin de Fer d'Orleans, are using oxyacetylene for all repair work at all their shops. This company alone consumed in the neighborhood of 2,500,000 cu. ft. of oxygen last year. The total production of oxygen for the year 1912 is given at about 30,000,000 cu. ft. for Germany and 10,000,000 cu. ft. for France."

Mr. Heller predicts a rapid extension in the uses of oxygen and hydrogen or oxygen and acetylene in this country as soon as the advantages of these processes are more generally understood.

Iron and Industrial Stocks

NEW YORK, April 9, 1913.

Stock values rose quite sharply on Friday of last week with the announcement of a material improvement in foreign financial conditions, indicating that the strain on this market was thus about to be relieved. On Monday, however, a less confident feeling prevailed with regard to European affairs and some recession occurred. The introduction of the tariff bill at Washington was a minor influence. The range of prices on active iron and industrial stocks, from Wednesday of last week to Tuesday of this week, was as follows:

Am. Can, com.....	34 3/4 - 38 3/4	Pressed Steel, com..	28 - 28 1/2
Am. Can, pref.....	97 - 99 1/2	Pressed Steel, pref..	98 - 100
Am. Car & Fdy., com.	51 1/4 - 52 1/2	Railway Spring, com.	32 3/4 - 34 1/4
Am. Car & Fdy. pr.	114 - 115	Republic, com.....	26 3/4 - 28 1/4
Am. Loco., com.....	37 1/4 - 39 1/4	Republic, pref.....	85 1/2 - 86 1/2
Am. Steel Foundries.	36 1/4 - 37	Rumely Co., com....	34 1/2 - 45 1/2
Bald. Loco., com.....	48	Rumely Co., pref....	79 3/4 - 86 1/4
Bald. Loco., pref....	104 1/2	Sloss, com.....	36 1/2 - 37 1/2
Beth. Steel, com....	35 - 37 1/2	Pipe, com.....	14 - 15 1/2
Beth. Steel, pref....	71 1/2 - 72 1/2	Pipe, pref.....	52 1/2
Case (J. I.), pref....	99 3/4 - 100	U. S. Steel, com....	61 1/2 - 64 3/4
Colorado Fuel.....	34 1/2 - 37 1/2	U. S. Steel, pref....	108 - 109 3/4
Deere & Co., pref....	98 - 98 1/2	Va. I. C. & Coke....	47 - 49
General Electric....	140 - 142 1/4	Westinghouse Elec..	65 - 67 1/4
Gr. N. Ore Cert.....	36 1/4 - 38	Am. Ship, com.....	52
Int. Harv., com.....	107 - 108 1/2	Am. Ship, pref.....	100
Int. Harv., new.....	107 - 107 1/2	Chic. Pneu. Tool....	50 3/4 - 51
Int. Harv., pref....	112 - 112 1/2	Cambria Steel.....	50 1/2 - 52
Int. Harv., Corp....	106 1/2 - 107	Lake Sup. Corp....	28 1/2 - 29
Int. Harv., Corp., pref.	112 1/2	Pa. Steel, pref.....	73 - 81
Int. Pump, com.....	10	Warwick.....	10 1/4
Int. Pump, pref.....	37	Crucible Steel, com..	15 1/4 - 16
Lackawanna Steel....	41	Crucible Steel, pref.	92 1/4 - 92 3/4
Nat. En. & St., com.	14 1/2 - 15 1/4	Harb. Wk. Ref., com.	48

Dividends Declared.

The Harbison-Walker Refractories Company, regular quarterly 1 1/2 per cent. on the preferred stock, payable April 19.

The Plymouth Cordage Company, regular quarterly, 2 per cent., payable April 18.

The Vulcan Detinning Company, quarterly, 1 3/4 per cent. on the preferred stock, payable April 21.

Henry R. Worthington, Inc., semi-annual, 3 1/2 per cent. on the preferred stock, payable May 1.

The Steel Company of Canada, Ltd., regular quarterly, 1 1/4 per cent. on the preferred stock, payable May 1.

Personal

Andrew Carnegie has given another \$1,000,000 to the endowment of the Carnegie Institute of Technology, Pittsburgh, making a total gift of \$8,000,000. The formal announcement of this gift is to be made at the Founders' Day exercises to be held in Carnegie Music Hall, Pittsburgh, April 24. Mr. Carnegie has sent word that owing to a previous engagement he will not be able to attend.

W. H. Doner, president Cambria Steel Company, has gone to Atlantic City to recuperate.

The work of John Stephens, who recently resigned the superintendency of the Parkersburg Iron & Steel Company, Parkersburg, W. Va., will be divided between two old employees, Frank Flagg, who has been with the company 11 years, will superintend the sheet and bar mills, the cold rolls and the annealing department. The remainder of the plant will be superintended by Walter Danks, son-in-law of Mr. Stephens, who for the past six years has been master mechanic of the company. He will have general supervision of the entire plant.

Charles B. Carter, for several months past associated with F. W. Graves in the sale of steel castings at Chicago, has renewed his connection with the American Brake Shoe & Foundry Company, with which he was formerly associated for a number of years.

William J. Alles, night superintendent Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has accepted the position of assistant to J. S. Haynes, manager Dodge Bros., Detroit, Mich., and will assume his new duties May 1.

William T. Shepard, treasurer of the Rogers-Brown Iron Company, Buffalo, is taking a short vacation at Hotel Chamberlin, Old Point Comfort.

Frederick Davidson, Pittsburgh, president New York State Steel Company since its reorganization recently, and who has been seriously ill at Philadelphia for some days, is rapidly recovering and it is expected will soon be able to assume the duties of his position with that company.

L. M. Waite has resigned as New York manager of the National Acme Mfg. Company, Cleveland, Ohio, and will become identified with the Fitchburg Machine Works,

Fitchburg, Mass. He has been connected with the National Acme Mfg. Company for about 13 years and prior to that was with the Cleveland Automatic Machine Company. He has long been a popular member of the Machinery Club of New York and has an exceptionally wide acquaintance with the trade generally.

Llewellyn W. Jones, works manager of the Taylor-Wharton Iron & Steel Company, High Bridge, N. J., and the Manganese Steel Safe Company, Plainfield, N. J., has been appointed works manager of the plants of Wm. Wharton, Jr., & Co., Inc., at Philadelphia and Jenkintown, Pa. He has charge of manufacturing at all the four plants named and will spend part of each week in Philadelphia and Jenkintown in the future.

W. S. Pilling of Pilling & Crane, Philadelphia, and E. G. Cook, of the Warwick Iron & Steel Company, Pottstown, Pa., have returned from a month's trip to the Panama Canal.

George A. Aykroyd, who has been chief draftsman of the roll department of the Lackawanna Steel Company for the past 10 years, has accepted the position of superintendent of the roll department of the Pittsburgh Crucible Steel Company, Midland, Pa.

A. F. Huston, president Lukens Iron & Steel Company, Coatesville, Pa., has returned from a sojourn of several months in the South, which included a visit to the Panama Canal.

Tate-Jones & Co., Inc., engineers and furnace manufacturers, Empire Building, Pittsburgh, Pa., have appointed as their railroad representative Henry Jungerman, formerly with the motive power and inspection department of the Harriman Lines.

W. C. McKee has been appointed superintendent of the blast furnaces of the Inland Steel Company, Indiana Harbor, Ind., succeeding J. E. Thropp, Jr., resigned. W. J. Rossman has been appointed to take charge of the labor department, succeeding Fred H. Fish, resigned. Both appointments were effective April 1.

Col. Charles M. Jarvis, president American Hardware Corporation, New Britain, Conn., has returned from a trip to London and other parts of Great Britain.

Arthur Haug, formerly chief chemist of the Rock Island Arsenal, Rock Island, Ill., has taken the position of chief chemist and engineer of tests at the Thurlow, Pa., plant of the American Steel Foundries Company.

Charles Kirchhoff sails for Europe Saturday, April 12, for an absence of several months.

E. H. Mentzer, formerly assistant superintendent of the tin plate plant of the Phillips Sheet & Tin Plate Company at Weirton, W. Va., has been made superintendent of its Pope works at Steubenville, Ohio.

James A. Campbell, president Youngstown Sheet & Tube Company, Youngstown, Ohio, has returned from a trip to Hot Springs, Ark.

Herbert Du Puy, chairman of the Crucible Steel Company of America, Pittsburgh, has returned from an extended trip to the Pacific coast, including the Hawaiian Islands.

William J. Dixon has been made superintendent of the labor and transportation departments at the Edgar Thomson steel works and blast furnaces of the Carnegie Steel Company at Bessemer, Pa., succeeding Thomas Cosgrove, deceased. Mr. Dixon was formerly assistant superintendent of these departments and has been succeeded by Joseph Lawler, Jr.

W. H. McFadden, formerly vice-president of Mackintosh, Hemphill & Co., Pittsburgh, who went to Oklahoma several years ago to engage in the oil and gas business, has been elected mayor of Ponca City.

G. Fred Collins has been appointed New England representative of the Eveland Engineering & Mfg. Company, Philadelphia, manufacturer of the Eveland electric riveters. His headquarters are the Hotel Bellevue, Boston, Mass.

B. J. Fernald has resigned his position with the General Electric Company, Pittsburgh, to enter the sales department of the Best Mfg. Company, Oakmont, Pa.

George T. Hannan, formerly general superintendent of the three plants of the Phillips Sheet & Tin Plate Company at Weirton and Clarksburg, W. Va., and Steubenville, Ohio, has resigned.

Obituary

ALEXANDER H. SHERRERD, who was one of the first chemists to be regularly and exclusively employed by an iron company, died March 14 at his home in Newark, N. J., aged 62 years. After graduating from Lafayette College in 1870, Mr. Sherrerd devoted two years to special analytical work and tutoring in that institution and in 1872 became chemist for the Lackawanna Iron & Coal Company, Scranton, Pa. In 1895 he went to Philadelphia and for a number of years was chemist for the Baeder & Adamson Company. Later he was engaged as district agent in the anthracite region, first for the Taylor Iron & Steel Company, Highbridge, N. J., and then for the Edgar Allen American Manganese Steel Company. He retired last fall and took up his residence in Newark, although at the time of his death he was acting in a consulting capacity for a prominent steel company. Mr. Sherrerd gained recognition for his painstaking care and exactness at a time when the present short cuts and quick methods were unknown in the iron industry. He leaves a widow and a son, Francis, superintendent of an asphalt paving company in Newark. John M. Sherrerd, of the Titanium Alloy Mfg. Company, and Morris H. Sherrerd, chief engineer of the Board of Water Supply, Newark, N. J., are his brothers.

WILLIAM H. FLETCHER, engineer and shipbuilder, vice-president of the W. & A. Fletcher Company, North River Iron Works, and president of the Consolidated Iron Works of Hoboken, N. J., died April 2 at his home in New York City, aged 56 years. Besides famous private yachts, he built many boats in service on the Hudson and for the New England steamship lines, among them the new Washington Irving. He was a member of the Engineers' Club, served as its president for several terms and took a prominent part in having the present building erected. He was for many years vice-president of the Webb's Academy and Home for Shipbuilders. He was secretary of the Robert Fulton Memorial Association and a member of the American Society of Naval Architects and Marine Engineers, American Society of Mechanical Engineers and New York Yacht Club. He leaves a widow, two sons and a daughter.

GEORGE WILLIAM QUINTARD, founder of the Quintard Iron Works, died April 2 at his home in New York City, aged 91 years. At the age of 15 he obtained employment in a grocery in this city. In 1847 he became a member of the firm of T. F. Secor & Co. Later he acquired an interest in the Morgan Iron Works, and after three years became co-partner with Charles Morgan, whose daughter he married. He was manager until 1867, when he sold his interest and became president of the New York & Charleston Steamship Company. Two years later he started the Quintard Iron Works, East Twelfth street, New York City, with which he was identified for the remainder of his business career, retiring about eight years ago.

ANTON BURCHARD, consulting engineer, Cleveland, Ohio, died April 4, at Ocean View, Va., aged 40 years. He had been in poor health for some time and recently underwent an operation. He was born in Washington, D. C., and received his college education at Dresden, Germany. For some time he was employed by the Wm. Cramp & Sons Ship Building Company and he was also connected with the construction department of the United States Navy. Later he was works manager of the Goulds Mfg. Company, Seneca Falls, N. Y. For several years he had resided in Cleveland and had been consulting engineer in the erection of plants for the American Fork & Hoe Company, the Peck, Stowe & Wilcox Company, the Upson Nut Company and others.

ROBERT CAREY, purchasing agent for the Juragua Iron Company, a subsidiary of the Bethlehem Steel Corporation, died suddenly March 29 at the company's office in South Bethlehem, Pa., aged 50 years.

J. F. DUNTLEY, father of W. O. Duntley, president Chicago Pneumatic Tool Company, and formerly vice-president of that company, died April 5 at Detroit, Mich., aged 71 years.

D. C. and William B. Jackson, engineers, Chicago and Boston, have removed their Boston office from 84 State street to 248 Boylston street.

Pittsburgh and Vicinity Business Notes

The Amsler Engineering Company, Wabash Building, Pittsburgh, has received a contract for remodeling eight hot blast stoves for the Roane Iron Company, Rockwood, Tenn. The company has two 80 x 16½ ft. blast furnaces.

The Pittsburgh Steel Company, operating steel hoop and band mills at Glassport, Pa., has given its employees an average advance in wages of about 15 per cent.

The Dawson Pump Company, organized by McKeesport, Pa., parties with a capital stock of \$250,000, will take over the plant of the Altoona Foundry & Machine Company, Altoona, Pa., and will manufacture valveless steam pumps. Thomas F. Wiley is president; George Turner, vice-president; L. N. Morgan, secretary and treasurer, and R. C. Dawson, general manager.

The Wheeling Steel & Iron Company, Wheeling, W. Va., is now manufacturing socket iron for its own use, having heretofore bought it in the open market.

The Cambria Steel Company, Johnstown, Pa., has placed an order with the Alliance Machine Company, Alliance, Ohio, for a 15-ton electric crane with a span of 118 ft. and a 15-ton crane with a span of 66½ ft.

The Carnegie Coal Company, of Pittsburgh, which some weeks ago took over the coal holdings of the Charle-roi Coal Company, owned by the Pittsburgh Plate Glass Company, has filed notice of an increase in its capital stock from \$800,000 to \$1,657,000, in order to provide for its increased property holdings. Its productive capacity will be more than doubled with this acquisition. The mines are located on the Monongahela River and have both rail and river shipping facilities. Most of the new coal will be shipped by the company to the upper Lake ports, where it has large coal storage docks for the Northwest trade.

Labor troubles developed last week at the plant of the Aluminum Company of America at New Kensington, Pa. The works employ about 2000 men, of whom about 700 went out on strike, and some departments of the plant are closed.

The Pittsburgh offices of the Chapman Engineering Company, which were in the Frick Building, have been removed to 1323 Oliver Building.

The Cambria Steel Company has donated \$5000 to the Ohio flood sufferers.

The Carbon Steel Company, Pittsburgh, has placed an order with the Shaw Electric Crane Company, Muskegon, Mich., for a 20-ton 3-motor crane with a 64-ft. span.

The Aluminum Company of America, Oliver Building, Pittsburgh, has placed contracts with Cleveland and Alliance concerns for 10 cranes of various capacities for installation in its plants at New Kensington, Pa., Massena, N. Y., and Knoxville, Tenn.

Pennsylvania Steel Company Improvements

In connection with an announcement, apparently made on authority, that the Pennsylvania Steel Company's preferred dividend will be reduced from 7 per cent. to 5 per cent., is the statement that preparations are being made to finance the company's requirements to the extent of \$3,000,000 a year for three years. Improvements are to be made and new equipment provided, but details are not yet given out. It is added that the Pennsylvania Railroad and the Philadelphia & Reading, which have control in the Pennsylvania Steel Company and Maryland Steel Company will provide the necessary funds.

A profit-sharing plan similar to that adopted by the United States Steel Corporation is announced by the Manufacturers' Light & Heat Company, Pittsburgh. The 800 employees of the company will be offered stock at \$50 a share, on a deferred payment basis. Employees receiving an annual salary of \$5000 or less may purchase from one to 15 shares of stock in proportion to the amount of salary received, and will be permitted to pay for the shares in small monthly payments, their accounts being credited with all dividends paid on the stock. At the end of each year they will receive a credit of \$2.50 per share, provided they are still in the employ of the company, their account being charged with interest on deferred payments.

Blaw Steel Construction Company's New Plant

The Blaw Steel Construction Company, Westinghouse Building, Pittsburgh, has completed and put in operation its new plant at Hoboken, Pa., about 10 miles from Pittsburgh, on the West Penn Railroad. Work on this plant was started last July; owing to the open winter, fast progress was made in its erection.

The main building is 120 x 600 ft., of steel construction and most carefully designed for light and ventilation. The receiving and shipping yards are equipped with three runways, one of which is 50 x 100 ft.; one 70 x 150 ft., and one 70 x 300 ft. The crane equipment consists of a 25-ton electric, a 20-ton, a 10-ton and several smaller. The installation includes a full line of iron working tools, shears, bending machinery, air compressors, etc. All equipment is electrically driven, each machine being fitted with its own motor. The company buys its power from the West Penn Traction Company. The plant has a productive capacity of 2500 tons per month, consisting of fabricated steel for mill buildings, galvanized steel electric transmission towers for power development plants, Blaw steel forms for concrete construction and other kinds of steel work.

An extension is being built to the office building at Hoboken, and when this is completed, which will be about May 1, the executive offices will be removed from Pittsburgh to the works, but a sales office will be maintained in the Westinghouse Building.

The old plant of the company, at Reynoldsville, Pa., has been dismantled; the buildings have been sold and are being removed. All the equipment has been sold except two horizontal tubular boilers of 100 and 125 hp. and a 200 kw. generator and engine, which have been removed to the new plant at Hoboken and are now in operation. Moses Lehman is president; A. C. Lehman and F. M. Bowman are vice-presidents; B. L. Hirshfield is treasurer; C. H. Lehman, secretary; Wayne Rawley, general superintendent, and C. D. McArthur, chief engineer.

Workers Give Up the Rubber Tire Strike

The strike in the Akron, Ohio, rubber factories has been officially declared off after practically all the employees had returned to work. It lasted about seven weeks, over 10,000 employees being out. At first only one plant was involved, the men complaining of a speeding-up system. At the outbreak of the trouble the I. W. W. organizers rushed to Akron and largely through their efforts the strike spread to about all the plants engaged in the tire-making industry. After the men went out they formulated wage demands that appeared entirely unreasonable. Popular sentiment in Akron was almost entirely with the manufacturers, so the strikers did not have the support of public opinion and the strike finally fizzled out without a single demand being gained. The dissatisfaction of the workmen did not appear to be due to the fact that they were not being well paid, but they gained the impression from reports that have come out regarding the large profits made by tire manufacturers that the workers themselves were not getting the share they were entitled to out of the industry.

Gathering International Testimony

An unusual order was made in the United States Court in Pittsburgh last week when permission was given to the International Steel Company, Wilmington, Del., and the Carnegie Steel Company, Pittsburgh, to gather testimony in France, Germany and England. The ruling is regarded as somewhat of an innovation. It will necessitate the questioning of the following experts in the countries named: Prof. Leon Guillet and L. Bacle, Paris; Paul Girod, Savoie; Dr. Fritz Rittenhausen and Dr. Ehrenfried Corleis, Essen, Germany; Dr. John E. Stead, Middlesbrough, England; F. W. Harbord, London, and Prof. J. O. Arnold, Sheffield, England. The International Steel Company is the plaintiff in an equity suit against the Carnegie Steel Company, alleging infringement of a patent for hardening iron and steel, the process being used in the manufacture of steel for battleships and called self-hardening. The bill of complaint claims that the International Company acquired the patent rights from James Churchward, of England. The suit will probably be argued in Pittsburgh in July.

March Copper Production and Stock

Though a decided decrease in the stock of copper was expected for March it exceeded anticipations. It amounted to 18,032,928 lb., as compared with only 986,134 lb. in February. This is all the more gratifying since the production for March exceeded that of the previous month by 5,302,968 lb. The March statement issued by the association compares as follows with the figures for the previous month:

	March. Pounds.	February. Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States at first of the month.....	122,302,198	123,198,332
Production of marketable copper in the United States from all domestic and foreign sources in the month.....	136,251,849	130,948,881
Deliveries of marketable copper in the month:		
For domestic consumption.....	76,585,471	59,676,492
For export	77,699,306	72,168,522
Total deliveries	154,284,777	131,845,015
Stock of marketable copper of all kinds on hand at all points in the United States at close of the month.....	104,269,270	122,302,198

There has been a marked increase in the domestic consumption, with a decrease in the foreign as compared with the two previous months.

Mesta Equipment for Trumbull Steel Company

The Mesta Machine Company, Pittsburgh, is furnishing from its works at West Homestead, Pa., practically all the equipment for the new sheet and tin mill plant being built by the Trumbull Steel Company at Warren, Ohio. This includes a tandem compound 34 and 60 x 60-in. engine to drive the mills through a double gear drive, using machine molded gears, the engine running at a speed of 75 r.p.m. and the mills 30 r.p.m. The plant will have six hot tin mills on one side of the engine and four sheet mills on the other side. The tin mills are 28 x 32 and 36 in., while the sheet mills are 28 x 38 and 44 in. The mills are of very heavy design, the housings being of cast steel and weighing 33,000 lb. each. There are 10 cold mills, driven tandem by a tandem compound engine 22 and 42 x 48-in. and are gear driven, all gears being cut cast steel. Both engines are non-condensing, equipped with Helander barometric condensers, also furnished by the Mesta Machine Company. The same maker will supply all the doubling shears, squaring shears, bar shears and roll lathes complete. The tin mill squaring shears will be driven from line shafting, while the sheet, squaring, doubling and bar shears and lathes will be driven by separate electric motors.

The firm of Day & Zimmerman celebrated on April 5 the culmination of eleven years of engineering practice in the industrial mechanical, scientific and public utilities fields and its moving into new offices at 611-613 Chestnut street, Philadelphia. A reception and buffet luncheon was tendered to a large number of invited guests and the opportunity was given to inspect the new quarters which occupy all but the first floor of the four-story building reconstructed for the firm. The administrative offices are located on the second floor, including the board rooms, the new business department and the department having charge of the management of the public service properties. The third floor includes the offices of the general manager, the purchasing, accounting and other departments, while the fourth floor accommodates the mechanical, electrical, civil and industrial engineering offices. The business at the beginning had largely to do with the rearrangement of equipment in industrial plants, but the firm gradually expanded to include power plant work for public service properties and finally the management and administration of such utilities.

The Carnegie Steel Company, Pittsburgh, has received a rush order for 500 tons of 12-in. United States piling from New Orleans, for repairing crevices in levees, liable to break with the high water looked for within 10 days. The railroads and property owners are paying for the piling, but it is to be driven by the Government. A special train is to be run through to New Orleans in not over four days. The Government has contracted to have the piling in place by April 20, and the company is giving the order preference over all others for this reason.

The Situation in the Flooded Districts

Blast Furnaces and Steel Works Affected Have Nearly All Started—Damage to Manufacturing Property Less than That from Loss of Business

The plants in the Pittsburgh, Mahoning and Shenango valleys and the Wheeling and Steubenville districts that were shut down by the flood of nearly two weeks ago are nearly all in operation again, but it has been impossible to get any definite information as to the financial losses or loss of output. All figures given in the daily press and elsewhere are mere guesswork. Some concerns have been able to start up their plants sooner than expected and with less actual loss than anticipated, while others are slower in getting started and their financial losses and damage to equipment will be heavier than early estimates. In many plants the water and mud got into the electrical equipment, causing a good deal of damage and starting up was delayed longer than anticipated. In the Pittsburgh district, as stated last week, the loss was comparatively slight and most of the idle plants have started.

Jones & Laughlin Steel Company

The South Side works of this company, or the American Iron & Steel Works, as they are better known, were not affected by the flood. The Soho blast furnace, also the open-hearth plant at Soho and the finishing mills in the Soho district, which were shut down for three or four days, are again in full operation. The wire rod and tin plate mills at Aliquippa, Pa., lost only a few turns and all the works of the company are again back in normal operation.

Carnegie Steel Company

In the Pittsburgh district the Carnegie Steel Company was inconvenienced very little by the flood, and its two Isabella and two Lucy blast furnaces, which were closed for a few days, are again in operation, as is also the Painter works, which was idle about a week. The blast furnaces and steel works of the company at New Castle, South Sharon, North Sharon, Youngstown, Mingo Junction and Bellaire that were closed, are again in full operation and getting out normal production. At Columbus, Ohio, one furnace and the Bessemer works have again started, and the other Columbus stack will go in about Friday or Saturday of this week. Reports that the Carnegie Steel Company had lost a blast furnace are incorrect, and probably arose from the fact that several months ago it scheduled No. 2 blast furnace at South Sharon, Pa., to go out for relining and repairs. On account of the flood it was necessary to bank this stack, and rather than start it again, it was decided to blow it out for relining and repairs. It will be ready for operation again about May 15. Of the 58 blast furnaces in Pittsburgh and the Central West owned by the Carnegie Steel Company 52 are in blast, the idle stacks being Edith, Neville, Steubenville, Zanesville, No. 2 at South Sharon and one Columbus stack. The loss in output of pig iron, steel and finished material by the Carnegie company was heavy, but has not been estimated.

Republic Iron & Steel Company

This company was a heavy loser by the flood, all its blast furnaces, Bessemer and open-hearth steel plants and finishing mills in the Youngstown district, Hall furnace at Sharon, Pa., and Atlantic furnace at New Castle, Pa., having been closed. The Bessemer steel plant at Youngstown went on again on Friday evening, April 4, after being off about 10 days, and the loss in output of Bessemer billets and sheet bars is estimated at 20,000 tons. The four Hazelton furnaces were all off, but Nos. 2 and 3 are going again, No. 4 is scheduled to start Friday or Saturday of this week, while No. 1 was blown out for relining and repairs and will be idle until about May 15. Hannah furnace at Youngstown was blown out early in March for relining and repairs and is scheduled to be ready for operation between April 10 and 15. Hall furnace at Sharon and Atlantic at New Castle are also on again, each having lost about a week's output. The open-hearth steel plant at Youngstown was closed about March 25 and at this

writing (Monday) has not started. There are eight 60-ton furnaces and the principal damage done was not by the water flooding the plants, but by water and mud getting into the electric generators. These have had to be taken apart and cleaned. All the finishing mills in the Brown-Bonnell and Mahoning works will probably be on this week. One furnace in the open-hearth plant was scheduled to start on Tuesday, April 8, and the other seven as fast as they can be made ready. It is expected to have the entire open-hearth plant on by April 15. This company states that its greatest damage was from loss in output. The pipe mills located beside the open hearth plant will be on full this week. Reports were printed that the Republic company had lost two or three open-hearth furnaces by reason of the water getting in before the heats could be drawn, but these are incorrect.

M. A. Hanna & Co.

Cherry Valley blast furnace at Leetonia, Ohio, was kept running right along, but Dover furnace at Canal Dover, Ohio, was banked for five days, the water being so high that access could not be had to the stock yards. Fannie furnace at Sharpsville, Pa., was banked so quickly that not enough coke could be charged and for this reason starting of the furnace has been delayed. It is expected to go in this week.

Youngstown Sheet & Tube Company

All the plants of this company, including three blast furnaces, Bessemer steel works, puddling plant, pipe, skelp, plate and sheet mills at East Youngstown, Ohio, that were stopped by the flood are again in full operation, the sheet mills being the last department to get started. The rod, wire, wire nail and fencing departments at Hazelton, Ohio, are also on full. The damage done by the water was very light, and the shutdown was caused by the water in the Mahoning river and the back water getting so high that the workmen could not get to and from the plants. The new open-hearth steel plant under construction by the Youngstown Sheet & Tube Company was flooded to some extent, which will delay its completion. It is not expected that the company will be making open-hearth steel before late in June, or possibly early in July. It has sold a considerable amount of open-hearth billets and sheet bars.

At Other Valley Works

The two blast furnaces of the Brier Hill Steel Company at Youngstown, were closed four or five days by the flood, and its sheet and other finishing mills about the same length of time. The new open-hearth plant was also flooded and this will delay considerably its completion. The company does not expect to be making steel before October next, and possibly later.

Practically all the other Valley works stopped by the flood have resumed operations. The entire plant of the Youngstown Iron & Steel Company, manufacturer of black and galvanized sheets and sheet metal specialties, is on in full. The damage to its works is slight, the heaviest loss being from restriction of output. The machine shops and foundry of the William Tod Company in Youngstown were flooded and some damage done to equipment, but the company expects to be in full running order again in a short time. The Lloyd-Booth department of the United Engineering & Foundry Company at Youngstown was also closed four or five days, but is again in full operation.

The three blast furnaces of the Shenango Furnace Company and Alice furnace of the Valley Mold & Foundry Company at Sharpsville, Pa., which were banked, are again in operation and turning out normal output. Stewart furnace of the Stewart Iron Company, Ltd., at Sharon, Pa., was badly damaged and has been blown out for relining and repairs. Ellis furnace of the Rickard Mather & Co. at West Middlesex, Pa., is again running.

Mechanical and Civil Engineers.

PITTSBURGH, PA.

National Tube Company

The two plants of this concern in the Pittsburgh district that were affected by the flood, the Continental and Pennsylvania works, both located on Second Avenue in Pittsburgh, are again in full operation and turning out normal output. The Lorain, Ohio, plant suffered very little and has been in full operation for some days. At Wheeling, W. Va., its Riverside works, including two blast furnaces, Bessemer steel works, skelp and pipe mills which shut down on March 27, did not get into full operation again until Monday, April 7. The two blast furnaces and the steel works started on Friday and Saturday of last week, but the skelp and pipe mills did not go on in full until Saturday and Monday. The National Tube Company estimates that owing to the prolonged shutdown of its Riverside works at Wheeling it lost upwards of 20,000 tons in output of finished tubular goods.

American Steel & Wire Company

In the Pittsburgh district the two Shoenberger blast furnaces, Bessemer steel works, rod and wire mills and the horseshoe factory were off for about a week on account of high water. One furnace went out for relining. The Farrell, Pa., works was idle a week or more, but is again running full, as is also the Rankin, Pa., works, which was closed about four days. The Braddock, Pa., plant was not affected.

American Sheet & Tin Plate Company

This company suffered very heavily by the flood, practically all its tin plate mills west of Pittsburgh being closed. However, good progress has been made in getting these started up again, and early this week all the plants made idle by the flood were again in full operation. The American works of the company at Elwood, Ind., did not start until Monday, April 7, after being idle a week for lack of steel. This plant was not affected in any way by the high water. The concern is making slower progress in getting its sheet mills started, three or four plants still being closed, partly because of the damage done by high water and also from the fact that they have no steel. The company was operating on Tuesday, April 8, 69 per cent. of its hot sheet mill capacity and 87 per cent. of its tin mill capacity.

Sharon Steel Hoop Company

Reports that the Sharon Steel Hoop Company, operating an open-hearth steel plant at Sharon, Pa., had lost three of its open-hearth furnaces by the flood are incorrect. The facts are that the water got into two of its furnaces before the heats could be drawn, but the company advises us it fully expects to save these two furnaces, and on Tuesday all of its open-hearth furnaces, blooming and finishing mills were in operation, but not to quite full capacity. It expects, however, to be making normal output within the next week or ten days at the farthest.

The Situation in Coke

Conditions on the railroads entering the Mahoning and Shenango Valleys and the Wheeling district are about normal again. The Pennsylvania Lines West and the Baltimore & Ohio lost a number of important bridges in the two Valleys, but temporary tracks have been laid and detours are being made by which coke is being delivered fairly promptly to the blast furnaces and steel works. The Pittsburgh & Lake Erie Railroad lost a few small bridges, but is again in fair running order. A number of the blast furnaces in the two Valleys were longer in getting started than would have been the case from the high water alone, for the reason that the railroads confiscated limestone destined for the furnaces, in order to make fillings under tracks that had been washed out, and some of the furnaces could not get either coke or limestone on which to run. The trouble over delays in coke and limestone to the Valley furnaces is now about over, and shipments are going forward fairly well.

Condition of Cleveland Blast Furnaces

Several Ohio blast furnaces that were banked during the flood were found to be in bad shape when the water receded and attempts were made to resume operation. Corrigan, McKinney & Co. decided to blow out both their River furnaces in Cleveland, but re-lighted the fires of

one April 7. They are now shoveling out the second stack and will blow it in before the end of the week. M. A. Hanna & Co.'s Fannie furnace at West Middlesex, Pa., and the Struthers Furnace Company's stack at Struthers, Ohio, which resumed last week were found to be in bad shape, both being slightly chilled, and they have been working very badly, their production for the past few days being small and an off grade iron. However, both are expected to be working in good shape before the end of this week. Other furnaces in which Cleveland companies are interested, that were banked during the flood, are running as usual and do not appear to have suffered injury.

While the coke situation has improved, railroad service throughout Ohio is still far from good and some furnaces are having considerable trouble in getting both fuel and limestone.

Metal Working Industries in Miami Valley and Cincinnati

CINCINNATI, OHIO, April 7, 1913.—Practically every manufacturing industry in southwestern Ohio suffered some loss on account of the recent floods. But the physical damage to factories is not nearly so great as has been reported by the daily press. On the other hand, the loss sustained by workmen, employers and others who owned their own homes, is even now incalculable. The necessity for relief to portions of some communities will exist for weeks.

In Cincinnati all of the factories in the bottoms were flooded, and many that were high and dry were handicapped for two or three days on account of the inability of their men to reach their places of employment. This condition has now disappeared and within 10 days every plant that was temporarily closed down will be in full operation, and the majority of them will be running on full time before the end of the present week. Among the fortunate plants in Cincinnati proper is that of the American Tool Works Company, which has been operating on full time. The Lodge & Shipley Machine Tool Company, whose shops are above the water line, built three large barges for transporting its workmen, and when these were put into commission no trouble was experienced. Others requisitioned skiffs to get their workmen back and forth. Since the water has receded it has been ascertained that the chief damage to Cincinnati industries has been that of having to suspend operations a few days. Not a single manufacturing building has collapsed.

The situation at Hamilton, Ohio, is not very different, so far as the manufacturing plants are concerned, but the physical damage there was much greater on account of the swift current. However, a calm survey would indicate that, with the exception of two factories that were destroyed, all will be running before the end of the present month. The two factories mentioned are those of the Champion Coated Paper Company and the Sohn & Rentschler Company. The former was burned during the overflow with a loss of over \$1,000,000, while the latter company's foundry was wiped out of existence by the flood. Contracts have already been let for rebuilding both plants and on a much larger scale. Some freaks of the flood at Hamilton are interesting. The Sanitary Mfg. Company's two-story plant, a frame structure, and located almost on the river bank, was only slightly damaged, in comparison with other buildings located some distance away where the water stage was much lower. The Long & Alstatter Company, the Hoozen, Owens, Rentschler Company, the Niles Tool Works, and others are making strenuous efforts to clean up, and will probably be in operation this week. All of them were put to much inconvenience on account of the destruction of part of their office records, but no valuable drawings or patterns were damaged, as in each factory they were stored above the second floor. The water did not reach the Hamilton Machine Tool Company's plant.

The American Rolling Mill Company, Middletown, Ohio, corrects the erroneous impression concerning the extent of damage at that place, conveyed by some of the daily newspaper dispatches. Middletown suffered from the flood, but conditions there are again normal. The East Side plant of the American Rolling Mill Company was idle one day and back water caused a brief suspension at the West Side works, but both have been in full oper-

ation in the past week and the company is not only taking care of its orders, but is in position to handle early specifications for iron and steel sheets.

Heavy Loss at Indianapolis

INDIANAPOLIS, IND., April 7, 1913.—It is two weeks since the flood of waters descended on Indianapolis, doing hundreds of thousands of dollars damage. Railroad and other communication is being rapidly restored, the railroads which have their bridges still standing co-operating with the roads that suffered in this respect. Neither the city nor the railroad companies have yet made estimates of losses in the destruction of or damage to bridges crossing White River and its tributaries. The largest city bridge, that at Washington street, built of stone and reinforced concrete, was entirely carried down and a steel bridge of three spans was partly wrecked. The Vandalia division of the Pennsylvania lost a steel bridge and another used by the Big Four and other roads also went into the river. Other city bridges were partly carried away and similar damage done to bridges over various streams in the county. Large bridges are down at Lafayette, Logansport, Peru, Fort Wayne and scores of points on the White River and the Wabash. The damage to factories in these cities consisted in the submerging of the basements or first stories. The iron industries of Indianapolis have been unable to make shipments except on three or four of the 16 railroad divisions that enter the city. Mail matter going and coming was delayed for days and telegrams were 48 to 60 hours in transit. The death loss was small in this city but 3000 families are homeless until they can refurnish their houses or have this done by public contribution. The Indianapolis City Council has voted \$50,000 for temporary repairs of bridges. Later there will be a bond issue to raise funds for rebuilding bridges.

Dean Brothers Steam Pump Works, Indianapolis, Ind., report that their plant was not affected in any way by the flood there. A temporary disarrangement of shipping is felt, but the railroads are rapidly resuming their service. The company can fill orders from stocks on hand.

Flood Notes from Various Districts

Manufacturing industries in Canal Dover, Ohio, suffered considerable damage from the flood. The Dover Mfg. Company, maker of sad irons, is reported to have sustained a loss of \$20,000 or more. One of the buildings of the Wagner Brothers machine shops collapsed. Among other plants that suffered damage was the sheet mill of the Reeves Mfg. Company.

The sheet mills of the West Penn Steel Company at Brackenridge, Pa., were closed down for two or three days. The mills are above high water, but the flood got into the waterworks located near the bank of the Allegheny River, compelling a shut down.

The Cincinnati Iron & Steel Company, Inc., Cincinnati, announces under date of April 5 that its flood troubles are over and that it has resumed shipments from its warehouses and yards, deliveries being only subject to such slight delays as may be due to the congestion of the railroads.

The Sidney Tool Company, Sidney, Ohio, contradicts the press report that the city of Sidney was nearly obliterated and many lives lost. Sidney is located on a hill and any serious damage from a flood would be an impossibility. The above company is taking care of its business as usual.

The Conover-Overkamp Machine Tool Company, Dayton, Ohio, announces that its machinery, tools, drawings and most of its patterns were saved. It has had a force at work cleaning up its shop and will be in operation again as soon as its power plant is rebuilt.

Rebecca blast furnace and the puddling mills of the Kittanning Iron & Steel Mfg. Company at Kittanning, Pa., were closed down for five days, from March 31 to April 5. The company had about 3 ft. of water in its mills and offices, the highest stage ever known. Its blast furnace and puddling mills are again in operation, but owing to scarcity of puddlers all the puddling furnaces are not yet running.

The Newport Rolling Mill Company and Andrews Steel Company, Newport, Ky., whose plants were recently

closed down on account of the high water, resumed operations this week. Both companies are taking care of their customers' wants from warehouse stocks.

February Exports of Iron and Steel

Exports of iron and steel manufactures in the 28 days of February aggregated \$30,700,000, or an average of considerably more than \$1,000,000 a day. In the eight months ended with February, 243 days, iron and steel exports aggregated \$243,000,000, these figures including with the general group, "iron and steel manufactures," agricultural implements, automobiles and cycles, of which iron and steel are the chief component materials. A comparison of the foregoing figures, compiled by the statistical division of the Bureau of Foreign and Domestic Commerce, with those for corresponding periods a decade ago, shows phenomenal gains in the exports of this class of manufactures. The exports of iron and steel manufactures in February, 1903, amounted to but \$10,000,000, and for the eight months ended with February, 1903, but \$75,000,000. Iron and steel manufactures in 1903 formed 7.8 per cent. of the total exports of domestic products, and in 1913, 14.3 per cent.

The table which follows shows the principal articles composed wholly or chiefly of iron and steel exported in the eight months ended with February, 1913, compared with the corresponding period of 1903. Figures of quantity are shown wherever possible.

Iron and Steel Exports in the Eight Months Ended with February.

Classes	1903	1913
Iron and steel manufactures.....	\$62,922,173	\$198,310,227
Agricultural implements	10,471,911	25,813,688
Automobiles	663,223	17,835,964
Cycles	1,253,348	739,643
Total exports of articles wholly or chiefly of iron and steel.....	\$75,313,655	\$243,699,522
Principal articles exported:		
Pipes and fittings.....	\$3,379,625	\$9,570,646
Builders' hardware	4,819,071	4,055,355
Tools	2,900,698	8,100,016
Castings	1,238,518	2,545,297
Firearms	667,271	2,530,102
Metal-working machinery	1,814,744	10,500,047
Printing presses	610,347	1,668,245
Pumps and pumping machinery.....	1,820,554	2,644,538
Sewing machines	3,177,948	7,404,604
Shoe machinery	498,245	1,231,616
Typewriters	2,406,767	7,509,262
Stoves and ranges	625,742	1,386,960
Gross tons		
Bar iron	6,658	17,572
Wire rods, steel	19,390	43,725
Other bars or rods of steel	9,816	159,739
Nails and spikes	23,915	53,803
Iron (galvanized) sheets and plates	1,892	110,838
Steel sheets and plates	8,241	258,493
Tin plates, etc.....	5,160	45,350
Wire	60,009	154,595
Hoop, band and scroll iron	774	11,281
Rails, steel	19,769	309,991
Billets, ingots and blooms	1,829	190,954
Structural iron and steel	22,805	214,090
Number		
Locomotives (steam)	215	451
Stationary engines	920	15,277
Cash registers	9,983	30,726
Safes	1,900	5,427

The National Metal Trades

The annual meeting of the National Metal Trades Association opened at the Hotel Astor, New York, Wednesday morning, April 9, with a large attendance. Tuesday evening the alumni dinner was held, at which were present many past officers of the association, as well as the present governing body. Former President F. C. Caldwell was the toastmaster, and H. N. Covell made the speech which accompanied the presentation to Henry D. Sharpe, the retiring president, of a beautiful antique coffee pot, as a recognition of the efficient work which he has done in his term of office, and the personal regard in which he is held by his associates.

Wednesday morning was given up to a meeting of the Executive Council with the presidents and secretaries of the branches, every branch being represented. At noon came a buffet luncheon for the members and their guests.

The Mesta Machine Company, Pittsburgh, is putting on the market a new blowing engine valve for which strong claims are made. The company states that by the use of this valve a blowing engine will develop practically twice the power without any additional operating cost.

Some Very Powerful Electric Locomotives

An order has been recently placed by the New York Central & Hudson River Railroad Company with the General Electric Company, Schenectady, N. Y., for nine of what are said to be the most powerful electric locomotives ever built. While these locomotives are lighter than the ones in use in the New York terminal service, weighing only 100 tons, as compared with 115 tons, they are much more powerful and the entire weight is carried on motor-driven axles, while the former locomotives had but 70 tons on the driving wheels. They will exert a sufficient tractive effort to haul a train weighing 1000 tons at speed of 60 miles per hour. In regular service they have a capacity for developing 1400 hp. continuously and for short periods 5000 hp. can be delivered.

In general, the new locomotives may be described as having an articulated frame with bogie guiding trucks at each end. The cab containing the engineer's compartments and that for the operating mechanism is swung between the two parts of the frame on the center pins. Each section is equipped with two two-axle trucks having a bipolar gearless motor mounted on each axle. The main frame of the locomotive is a box girder, built of 10-in. channels with 1/4-in. top and bottom plates. It is approximately 10 in. deep, 36 in. wide and 22 ft. long. This type of design affords a long flexible wheelbase with eight axles, but restricts the length of any rigid portion to not more than 78 in.

The cab, which is carried on the two center pins as mentioned, has its weight distributed between the two halves of the locomotive frame and is divided into three sections. A motorman's compartment is located at either end and contains the motorman's seat, controller, air-brake, valves, bell and whistle rope handles and such parts of the control apparatus as have to be within easy reach of the engineer. The air compressors, blowers, contactors and rheostats, grouped so that they are conveniently accessible for inspection and repair, are located in the central section of the cab. This general type of construction leaves a fairly long platform at either end of the locomotive and access to the cab is obtained through doors opening on it.

Each motor has a capacity of 325 amperes at 600 volts for 1 hr. or a continuous rating of 250 amperes under forced ventilation. These motors are connected permanently in parallel in pairs, and the pairs can be connected in series, series-parallel or parallel combinations. The current is collected by eight under-running third-rail shoes, or by two overhead trolleys, when operating on gaps on the third-rail.

Electric Power Output of the United States

The combined electric output of the 7500 central stations in the United States for the year ended December 31, 1912, was 12,000,000 hp. While this amount is, of course, large, it is only a part of the total electric power generated, as it includes only public service companies and takes no account of the great railroad and manufacturing companies which produce and use their own power; so that the total power generated is easily double the output of the central stations.

It would take nearly 5,000,000 of the largest standard locomotives which pull the fast passenger trains and are rated at approximately 5000 hp. to equal the energy produced by the American electric power plants. The engines of the largest transatlantic liners, which are nearly 1000 ft. long, are rated at 70,000 hp. To equal the electric power output of the United States would require 342,857 of these vessels, with a combined length that would reach more than twice around the world. It is estimated that the total business in electrical machinery in the United States in 1912 amounted to approximately \$300,000,000.

The business of Milliken Bros., Inc., New York, manufacturers of structural steel, is being carried on successfully by the receivers. A protective committee of the first mortgage bondholders, which is composed of William Salomon, Jules S. Bache, Christopher D. Smithers and Eben O. McNair, is endeavoring to formulate a reorganization plan, satisfactory to all bondholders and creditors.

Customs Decision

Steel Wire Rope

The Board of United States General Appraisers has sustained a contention by the Mill & Mine Supply Company, relating to the classification under the tariff act of steel wire rope. Duty was assessed by the collector at Port Townsend, Wash., at 35 per cent. and 1c. per lb. under paragraph 135. The wire was claimed dutiable properly under the same paragraph at 1 3/4c. per lb. plus 1c. per lb., but not less than 40 per cent., the minimum rate under the law. The issue was one of fact only and turned on whether the specific rate of duty is the maximum rate imposed on the wire used in the manufacture of the wire rope. In the manufacture of the rope, round steel wires smaller than No. 16 wire gauge are grouped to form stands and a number of stands so formed are twisted around a hemp core.

Judge Fischer states in his decision, finding for the importer, that the rate of 35 per cent. is a minimum rate fixed on all round iron or steel wire. The invoices gave the value of the wire used in the manufacture of the wire rope, and the question was whether on the basis of such values the specific rate of 1 3/4c. per lb. figures more or less than the 35 per cent. rate. The values as given on the invoices were not challenged by the customs authorities. The collector, however, in his letters of transmission, referred to the value of the reels used in importing the rope. On this point, the decision says in part: "It would be manifestly improper to include the value of such reels as a part of value of wires used in the manufacture of the rope. The reels are used to import the finished wire rope and not round steel wire smaller than No. 16 wire gauge, the foreign market value of which they clearly form no part. On the basis of the value of the wires the specific rate of 1 3/4c. per lb. figures out more than the 35 per cent. rate. The applicable governing rate for the wire rope referred to we hold is 1 3/4c. per lb. plus 1c. per lb., but in any event not less than 40 per cent. These last mentioned rates must be levied respectively on the weight or value of the finished steel wire rope. The protests are sustained."

The Allis-Chalmers Company's Affairs

The Chicago property of the Allis-Chalmers Company, which was placed in the hands of a receiver a year ago, was sold at public auction April 8 for \$1,000,000 to J. H. McClement, of New York. This completes the preparations for the reorganization.

On the same day Attorney-General Owen, of Wisconsin, advised the Secretary of State that the Allis-Chalmers Mfg. Company of Delaware should be allowed to file its articles of incorporation. The opinion says the Secretary of State must as a mere administrative duty accept the fee and file the articles, thus permitting the company to do business in Wisconsin; however, if the annual report should prove the capital larger than stated in the application the State can collect a larger fee. Investigation if the company is doing proper business is declared legal at any time.

The Yale & Towne Mfg. Company, Stamford, Conn., is offering its stockholders the privilege of subscribing to \$1,000,000 additional common stock at par in the ratio of one new share for every two shares held. Payments must be made of \$30 per share on or before May 10; \$30 on July 10, and \$40 on October 10. Subscription warrants must be returned to reach the treasurer on or before May 10. No subscription will be received for half shares, but exchange warrants to subscribe for half shares will be issued to holders of odd shares of stock which may be exchanged for warrants for full shares in even multiples of two half shares.

The assessment of the properties of the Tennessee Coal, Iron & Railroad Company, in Alabama, says a Birmingham dispatch, has been increased by the State tax board from \$10,000,000 to \$19,000,000. A much greater raise was sought by the board, but a compromise was effected on the foregoing basis.

The Machinery Markets

Reports from several cities indicate slackened activity in the machinery trade, but this condition is offset to some extent by two or three large deals for railroad shop equipment which are closing or pending and the fact that unusually abnormal conditions have caused the lull in some places. A good part of the business which was prostrated by the Middle Western floods is not yet fully resumed and this accounts for some unfavorable reports. Not much has been said of tariff probabilities and consequent effects upon the trade which is itself seeking light upon the subject. In New York business has been irregular, but the influence of some large transactions has been felt. In Philadelphia, as in New York, further inquiries have been received from the Pennsylvania Railroad, but demand is rather unsatisfactory. New England manufacturers keep busy, but some hesitation is noticed in making business improvements which were planned some months ago. Scattered demand and fairly good business pending are the features in Cleveland, although the effects of the floods still hamper activity. While large transactions have been wanting in Detroit and there is a tendency toward dullness, conditions are not considered as entirely unsatisfactory in view of the prospects. In Chicago, some good railroad business which has been placed and more which is in prospect are the features; here, too, interruptions to trading have been caused by the recent floods. Milwaukee is busy and reports a decided shortage of labor. Flood conditions are fast improving in the Central South. Conditions are normal in Birmingham and promise to remain so. The St. Louis market is quiet, but small inquiries are increasing in number. In Texas the mining industry is showing signs of increased activity and sales of equipment are anticipated. Some good-sized orders are coming out on the Pacific coast and considerable business is in prospect.

New York

NEW YORK, April 9, 1913.

With a good part of the trade the week has been quiet, despite the closing of at least one big proposition which brought orders to New York houses. While a few dealers assert that business has been fairly satisfactory, other sellers say that trade has been slow and that the best feature of the situation is the promising inquiries. That there is slowness in closing, especially on the part of smaller buyers is evident. To questions as to what is thought of the new tariff bill which specifies a duty of 15 per cent. on machine tools, as against the 30 per cent. now operative, few opinions are available. Most of those who are interested in the new schedule are representatives of manufacturers and undoubtedly hesitate to express opinions before their principals make their attitude known. None seemed to be worried over the proposal and all said they had given the subject very little thought. One manufacturer whose plant is in the vicinity of New York said that it was too early to say just how the new tariff act would work out if it becomes a law and that its full effect would probably not be felt until some months after that event. With regard to some lines of machines it was admitted that foreign competition is not to be feared, while in other lines a reduction of duty can do American manufacturers no good and may possibly inflict actual injury. The attempt to define machine tools in the new bill was declared a step in the right direction, but it was asserted also that the framers of the bill would have done still better to have undertaken a classification which would have designated each tool in accordance with the work which it does.

Requests for estimates on the requirements of the Pennsylvania Railroad continue to be received at local offices and this prospective business is rapidly approaching the large proportions anticipated by the trade. The placing of orders by the Boston & Maine Railroad, referred to last week, has proceeded steadily and has been sufficiently distributed to cause considerable satisfaction. The business recently placed by the General Vehicle Company, Long Island City, amounted to \$30,000 and it has been reiterated that this company will be a large buyer late this year.

The New York office of the Alliance Machine Company, Alliance, Ohio, has taken orders recently for the following cranes: 2-ton trolley and 100-ton crane for the Midvale Steel Company; 10-ton trolley for the open-hearth department of the Bethlehem Steel Company and two 75-ton four-girder ladle cranes for the same company; three 10-ton double-legged gantry cranes of 70-ft. span for the Wm. Cramp & Sons Ship & Engine Building Company. The same office also received an order for one 2½-ton high-type floor-charging machine for the Raritan Copper Works, Perth Amboy, N. J.

The Turner Construction Company, 11 Broadway, New York, has been awarded the general contract by the Robert Gair Company, paper goods manufacturer, for a factory building to be erected at Washington and Front streets, Brooklyn. The plans are by William Higginson, architect, and call for a building 125 x 200

ft., 10 stories, of reinforced concrete throughout and fireproof in every detail. Work will be started at once.

The Splitdorf Electrical Company of New York has been incorporated under the laws of the State of New Jersey with a capital stock of \$25,000. The company is a subsidiary of the Splitdorf Electrical Company, Sixty-third street, New York, and has been established for the purpose of taking care of the service end of the Splitdorf business in this territory.

The wagon factory of the Cope Company, Hilton, N. J., was burned April 3 with almost a total loss. Plans for rebuilding are not as yet announced.

The Leader Iron Works, Decatur, Ill., states that while it has built a large warehouse and office building at Owego, N. Y., it does not contemplate at this time the erection of a manufacturing plant there, and that reference to that effect in *The Iron Age* of March 27 was erroneous.

The Eclipse Tanning Company, Newark, N. J., is having plans prepared for the erection of an extension to its plant on Nesbit street, estimated to cost \$35,000.

The Franklin County Hydraulic Corporation, Watertown, N. Y., has been incorporated with a capital stock of \$100,000. The company will develop power at Chasm Falls and Titusville, N. Y., and operate a ground-wood plant at Chasm Falls and a sawmill at Titusville. Mark S. and Harry C. Wilder, Watertown, and Brayton R. Clark, Malone, are the directors.

The Keiley-Whitney Extract Company, Elmira, N. Y., will erect and equip a three-story and basement factory building, 50 x 100 ft., at Lake and East Fourth streets, for the manufacture of perfumes. The estimated cost is \$60,000.

The Sedgwick Machine Works, Poughkeepsie, N. Y., manufacturer of elevators, dumb-waiters, etc., Dwight R. Sedgwick, manager, will erect and equip an enlarged plant on a new site. Plans are now in preparation.

The State Senate at Albany has passed a bill authorizing the State Conservation Committee to construct power plants at the barge canal dams at Vischers Ferry and Crescent on the Mohawk River for the development of electrical power from the surplus waters of the barge canal. The appropriation is \$650,000.

The Century Foundry Company, Syracuse, N. Y., has been incorporated with a capital stock of \$40,000. The company will equip a plant for the manufacture of iron and brass castings. Edmund Baumer, 1704 South Salina street; David W. Hempstead and William Klaila are the incorporators.

The Municipal Electric Light Commission, Jamestown, N. Y., is receiving bids for transformers and meters required for the municipal lighting system.

The Walcott Knitting Company, Utica, N. Y., has increased its capital stock from \$25,000 to \$30,000 to provide for additional manufacturing facilities.

An addition, 50 x 75 ft., one story, is being made to the plant of the American Malleable Castings Company, Central avenue and the Erie Railroad, Lancaster, N. Y.

The plant of the Deyo-Macey Company, Binghamton, N. Y., manufacturer of gasoline engines, has been purchased by the Massey Harris Company of Toronto,

Ont. The capacity of the plant will be enlarged by the new owners at once.

The Niagara Falls Linen Company, Niagara Falls, N. Y., is building an addition to its plant on Highland avenue.

The United States Lighting & Heating Company, Niagara Falls, N. Y., is completing plans for the erection and equipment of a further addition to be made to its power plant building.

The W. G. Fahnestock Company of Philadelphia will at once erect a three-story and basement factory, 120 x 150 ft., at Paynes avenue and the Erie Railroad, North Tonawanda, N. Y., and equip it for the production of cocoa and chocolate. The estimated cost of building and equipment is \$150,000.

Fire at the copper smelting plant of the Buffalo Smelting Works, Austin street and the Niagara River, Buffalo, April 5, destroyed a three-story cupola and badly damaged the company's machine shop adjoining. The estimated damage is \$50,000. Replacement will be made at once.

The Clarks Patents Company, Buffalo, N. Y., has been incorporated by James M. Clark, 3rd, Bradley Goodyear, Charles Pearson, Jr., and Howard G. E. Smith of that city to manufacture and sell patented firearm attachments and other iron and steel specialties.

New England

BOSTON, MASS., April 9, 1913.

Business continues in much the same volume as in the past month. A slightly increased hesitation in going forward with planned improvements in manufacturing facilities is noted, but the influence is not great and should diminish with the knowledge of the proposed tariff bill, as announced last evening. Taking into account that the bill is only the basis upon which Congress will act, and that the individual efforts of members from the various sections of the country to take care of their constituents' interests will probably tend to increase the named degree of protection, the prospect is not nearly so menacing as some alarmists have tried to make it. Machine tools are left with 15 per cent. protection, instead of the free list as provided by the last Underwood bill, and have been placed in a class by themselves, a fact which proves the efficiency of the campaign of education which has been conducted by the National Machine Tool Builders' Association and its members.

The machine tool builders of New England are busy. Where machines are of specialized types the works are rushed with orders. Some shops, producing the older standard machines, are not quite so active.

The Boston & Maine Railroad has awarded the contracts for some of the machinery named in the great list for the new Billerica shops, but the greater part of equipment is yet to be ordered.

The Crompton & Knowles Loom Works, Worcester, Mass., manufacturer of textile machinery, will consolidate its Philadelphia shops in its plant at Worcester, and will erect large additions in order to provide the necessary capacity. One building will be 100 x 218 ft., two stories, and an additional story will be given an existing factory 214 x 270 ft.

The Worcester Lawn Mower Company, Worcester, Mass., will build a plant on Fremont street, consisting of a two-story building 60 x 150 ft., with an ell 60 x 65 ft.

The Matthews Mfg. Company, Worcester, Mass., metal stampings, will build a factory on Hammond street, 40 x 75 ft., three stories.

The Gray & Davis Company, Boston, Mass., manufacturer of automobile accessories, will establish a factory at Cambridge. The building will be 80 x 380 ft., five stories, of reinforced concrete. The architects have given the windows 70 per cent. of the wall area. All modern conveniences for production and sanitation and for the comfort of employees are embodied in the plans.

The city of Cambridge, just across the Charles River from Boston, is growing very rapidly industrially. The large factory of the Ford Motor Company has been mentioned. In addition to the Gray & Davis Company's factory, the Pierce-Arrow Company will build a large service station. The Carr Fastener Company and the Bacon Furniture Company have purchased sites for factories. The new building of the Revere Rubber Company will cost \$120,000. Other smaller additions to the manufacturing activities of the city are reported.

The ship canal across Cape Cod which is in process of construction by the Boston, Cape Cod & New York Canal Company, will not be completed as scheduled, and the company has petitioned the Massachusetts

authorities for an 18 months' extension to its charter, which will bring the date of completion to the last of December, 1915. The canal, when completed, will be a great benefit to New England shipping and should influence freight rates.

The strike of employees of the Draper Company, Hopedale, Mass., manufacturer of textile machinery, initiated by the Industrial Workers of the World, is confined largely to the non-English speaking workmen. The works are located in a township having practically no other industry. The owners have created ideal conditions in their shops and in the housing of the families of their people. This is the first strike in the 97 years since the business had its beginning. No unions have existed at Hopedale. The present trouble is directly due to the radical change in personnel of employees, made necessary by the dwindling away of American bred labor, coupled with the work of discord-breeding agitators. The better class of workmen are not involved in the strike.

The Clark Bolt Company, Milldale, Conn., will build an addition 50 x 80 ft., one story.

Additions to general manufacturing facilities in New England include the following: Salts Textile Mfg. Company, Bridgeport, Conn., power house and weave shed in addition to enlargements already announced; H. O. Canfield Company, Bridgeport, Conn., three-story building, 52 x 74 ft.; Hartford Carpet Company, Thompsonville, Conn., four-story storehouse 60 x 300 ft.

The Bridgeport Brass Company, Bridgeport, Conn., will erect one-story additions 43 x 70 ft. and 16 x 25 ft.

The Connecticut Company will build an addition to its power house at Waterbury, 56 x 95 ft., of brick, steel and concrete.

The Turner Construction Company, 11 Broadway, New York, has been awarded the general contract for the construction of building No. 43 of the General Electric Company, Pittsfield, Mass. This building is to be 63 x 500 ft., five stories, of reinforced concrete throughout.

Announcement is made at Providence, R. I., that Allen W. Phillips, South Attleboro, Mass., has taken space in the building of the William A. Harris Steam Engine Company, where he will establish a steel-treating plant.

The Turners Falls Company, Turners Falls, Mass., will soon award the contracts for its great hydroelectric plant, known as power plant No. 2. Electricity to the amount of 40,000 hp. will be generated.

The contract has been awarded for the additional factory of the American Pier Company, Waterville, Conn., which will be 50 x 250 ft., four stories and basement. The building will be of brick with steel trusses.

The Hendee Mfg. Company, Springfield, Mass., builder of motorcycles, has decided to increase the size of the factory at East Springfield, the foundations of which are in process of building, adding some 20 per cent. to the capacity as originally laid out. The details of the new plant have been given in this column.

The Southbridge Optical Tool Company, Southbridge, Mass., manufacturer of tools used in the optical goods industry, will move its business to Providence, R. I., where larger quarters have been secured.

The Bay State Elevator Company, Springfield, Mass., has purchased 11 acres of land in East Springfield on the Athol Branch of the Boston & Albany Railroad, and will erect new works on the premises, consisting of a one-story building 200 x 210 ft. The business was established four years ago by A. Youngberg and James L. Shannon on a very small scale and has grown with much rapidity, until the present quarters at 51 Taylor street are no longer adequate.

Philadelphia

PHILADELPHIA, PA., April 7, 1913.

The recent list of tools covering the general requirements of the Pennsylvania Railroad has been supplemented in the week with a number of additional inquiries. While partial lists have been largely sent out to a selected list of manufacturers and merchants, it is believed that, in the aggregate, it will fully comprise 100 different tools. As far as can be learned no purchases have yet been made. Outside of the railroad inquiry the demand has been rather inactive, business being confined largely to odd single tool propositions. Merchants report considerable delay in communication with western tool manufacturers, owing to the interruption of business generally by the floods. The second hand machinery market continues to drag; in some instances a fair volume of business has been moving, but the general demand is reported as being unsatis-

factory. Power equipment has been in comparatively good demand. Machine tool makers continue fairly well engaged. Plant operations are about on an even basis, but few, except special tool makers, are fully engaged.

George D. Porter, director of public safety, Philadelphia, will receive bids April 15 for a portable autogenous cutting, welding and brazing apparatus, complete; steel lockers for the Fifty-fifth and Pine streets police and fire station and for electrical and switchboard equipment.

The Allentown Brass & Mfg. Company, Allentown, Pa., has been incorporated under the Pennsylvania laws, with a capital stock of \$20,000, and will engage in the manufacture of brass castings, hardware, etc. A plant is now being erected at Rittersville, Pa. The incorporators are James T. C. Krasley, 29 North Oak street, East Allentown, Allentown, Pa.; Jacob Pudliner and Daniel D. Trexler.

Permits have been taken in Reading, Pa., for the erection of a three-story brick garage at Chestnut and Pearl streets for the Central Motor Car Company, which is to have the customary garage equipment.

It is reported that the Philadelphia & Reading Railway has completed plans for a repair and machine shop at St. Clair, Pa. The repair shop will, it is stated, be 100 x 600 ft., and the machine shop 50 x 400 ft. Details as to equipment requirements are not available.

The Tin Decorating Company, Baltimore, Md., will shortly receive bids for the erection of its new manufacturing plant. This concern is closely identified with the American Tobacco Company interests and will manufacture and decorate tobacco and other tin boxes.

An interesting export order has been taken by John D. Adt, Baltimore, Md., comprising a consignment of special tobacco working machinery for shipment to Iceland. The same manufacturer reports heavy orders for both the domestic and the export trade. Orders for three electric freight and one electric passenger elevator have recently been taken. The plant is operating at full capacity and will be considerably enlarged this month, although no additional equipment will be required.

Riggs, Distler & Stringer, Inc., power, heating and ventilating engineers, 78 East German street, Baltimore, Md., have removed to 23 and 25 Light street, occupying a four-story building, 40 x 50 ft. This concern has recently closed considerable business in boilers and engines, including a 150-kw. direct-connected engine for the Crisfield Ice Company, Crisfield, Md. A good volume of business in power vacuum cleaning apparatus has been taken. This concern has added to its other lines that of general contracting in plumbing, in which several good contracts have been entered.

It is reported that work has been begun on a new boiler house and engine room for W. H. Luden, Reading, Pa. The building is to be in the rear of the present plant and will measure 36 x 93 ft.

The Department of Supplies, Philadelphia, will take bids until April 18 for furnishing various supplies in April, May and June, including under Class V, iron, brass and steel castings.

The Moore & White Company is rebuilding a portion of its machine shop at Fifteenth street and Lehigh avenue. A new addition, three stories, 70 x 70 ft. will be erected. No immediate purchases of machinery will be made although later on several tools will be required to fill in the line.

Chicago

CHICAGO, ILL., April 8, 1913.

The event of greatest interest in this market in the past week, the more prominent because of the prevailing quiet in other directions, was the formal closing of the Wabash Railroad tool requirements. Orders for a large portion of the machine tools on the list were awarded to Jos. T. Ryerson & Son, the remainder being distributed. In the near future specifications are expected to be issued by the Chicago and Northwestern Railway covering the equipment to be installed in its new shops at Clinton, Iowa. The usual number of miscellaneous orders are noted. Local representatives of machine tool builders with plants in the flood districts report serious interference with the regular routine of business, plant operations and intercommunication being far from normal.

The Monarch Motor Mfg. Company, Chicago, has in contemplation the erection of a one-story machine shop, 50 x 75 ft., to cost \$15,000.

The Furin Drop Forge Company, Chicago, has taken out a building permit covering the erection of a one-

story forge shop of brick construction, 48 x 75 ft., to cost \$3,500, at 347 Root street.

The People's Gas Light & Coke Company, Chicago, will build a brick garage and shop, 103 x 147 ft., at 9549 Houston avenue, at a cost of \$30,000.

C. F. Wolff, 153 West Ohio street, Chicago, maker of boxes, is building a four-story addition to his factory at a cost of \$15,000.

The Watling Scale Company, Chicago, has acquired an interest in the business of the Pacific Scale Works of Fond du Lac, Wis., with a view to the better distribution of its manufacturing operations.

The O. W. Holmes Steel Company, Chicago, has been organized with a capital stock of \$100,000 by Oliver W. Holmes, David A. Pyott and Walter E. Pond. The new corporation will continue the architectural, ornamental and structural iron work that has been conducted under the name of Holmes, Pyott & Co., 159 North Jefferson street.

The C. F. Goodrich Switch Company, Chicago, has been organized with a capital stock of \$2,500 to manufacture railroad equipment and machinery. The incorporators are C. F. Goodrich, Paul Schroeder and Joel Baker.

The People's Gas Regulator Company, Chicago, with a capital stock of \$25,000, has been organized for the development of gas-savings devices. The organizers are Richard H. Mathers, 10 South La Salle street; A. M. Olson and William A. Sheehan.

The Universal Gas Iron Company, Rock Island, Ill., has been incorporated with a capital stock of \$50,000 to manufacture gas-heated irons and other similar articles. The incorporators are George W. LaRue, B. V. M. LaRue and J. Kirth Collins.

The new plant of the E. M. Burr Foundry Company, Champaign, Ill., is rapidly nearing completion. The foundry is a building 120 x 132 ft., arranged in three bays, the center 50 ft. wide and spanned by an electric overhead traveling crane and two side bays each 35 ft. in width. The structural shop, like the foundry, is of steel construction, and is 100 x 136 ft.

The H. C. Beebe Company, Peoria, Ill., has been organized with a capital stock of \$11,000 to operate a wood-working plant in that city. The incorporators are H. C. Beebe, T. E. Frantz and F. D. Zimmerman.

The Gary Screw & Bolt Company, Gary, Ind., will build an addition to its works for the housing of a pickling department. It will be about 70 x 100 ft.

City Engineer Wilson of the town of Manley, Iowa, is preparing plans for a municipal machine shop, 50 x 102 ft.

The Billings Bridge & Steel Company, Billings, Mont., recently organized with a capital stock of \$25,000, will operate a foundry, machine and structural steel shop. Those interested in the organization are J. C. O'Donnell, C. A. O'Donnell and Richard Moser.

Indianapolis

INDIANAPOLIS, IND., April 8, 1913.

The Marion Foundry Company, Indianapolis, has been incorporated with \$6,000 capital stock to do a general foundry business. The directors are C. F. Miller, E. E. Lollar and E. J. Askren.

The Smelser Engine & Machine Works, Indianapolis, has been incorporated with \$50,000 capital stock to manufacture gasoline engines, trucks, pumps and traction devices. The directors are Lee Smelser, Noble H. Wible and Guy M. Churchill.

The Shoals Electric Light Company, Shoals, Ind., has been incorporated with \$10,000 capital stock to operate an electric plant. The directors are John T. Morris, Chas. O. Williams, Fabius Gwin, Oliver M. Wallace and James B. Marshall. The Shoals Mfg. Company, makers of furniture, with \$15,000 capital stock, has the same directorate.

The Universal Hydraulic Stone Company, Mishawaka, Ind., has been incorporated with \$50,000 capital stock to manufacture concrete products. The directors are A. G. Graham, G. A. Crane and E. L. Spencer.

The Dickover Cement Products Company, Valparaiso, Ind., has been incorporated with \$5,000 capital stock to manufacture clay products. The directors are C. H. Dickover, P. E. Marks and G. O. Dickover.

The United States Electric Company, Anderson, Ind., has been incorporated with \$10,000 capital stock to manufacture electrical devices. The directors are Frank P. and Martin Dunn and George P. Louiso.

The Linton Gas Company, Linton, Ind., proposes to spend \$200,000 in enlarging its plant to enable it to supply gas to Sullivan, Jasonville and other nearby towns.

The General Service Company, Lafayette, Ind., has been incorporated with \$10,000 capital stock to supply heat, light and power to Lafayette, Ft. Wayne, Bluffton, Montpelier, Anderson, Logansport and several other cities. The directors are Thomas B. Frazee, Henry J. Roach and William A. Giest.

The Moellering Brick Company, Ft. Wayne, Ind., has been incorporated with \$25,000 capital stock to operate a brick and tile factory. The directors are William F., Charles E., Edward H. and Henry F. Moellering and Henry A. Gerberding.

The Ft. Wayne Builders' Supply Company, Ft. Wayne, Ind., has increased its capital stock from \$75,000 to \$125,000.

The Rochester-Mais Commercial Car Company, Rochester, Ind., has been incorporated with \$25,000 capital stock to make motor vehicles. The directors are J. A. Mais, A. C. Davisson, Earle A. Miller, J. M. Ott and R. P. True.

The Edgewater Steamship Company, Gary, Ind., has been incorporated to operate steamship lines on the great lakes. The directors are Arthur C., Harry J. and Paul E. Sullivan.

The Annex Milling Company, Tunnelton, Ind., has been incorporated with \$5,000 capital stock to operate a sawmill. The directors are Andrew Dodds, Elmer E. Faris, Daniel B. Guthrie, Noble Malott and William H. Reed.

The Montpelier Cup & Metal Works, Montpelier, Ind., has been reorganized under the name of the Montpelier Mfg. Company, with \$50,000 capital stock. The directors are Leander E. Maddox, Ambrose G. Lupton, Alexander T. McDonell, Guy R. Brackin and James O'Donnell.

Cleveland

CLEVELAND, OHIO, April 8, 1913.

The local machine tool market has not yet recovered from the effects of the floods. Mail service between this city and much of the state continued very unsatisfactory in the week and it has probably had something to do with the absence of a demand. Railroad traffic has rapidly been restored but a portion of some lines are still out of commission. There is some fairly good business pending in Cleveland, but buyers are rather slow in placing orders. There are no new inquiries of any size. Machine tool builders report a very scattered demand from railroads and a very active call for machinery from car builders. Considerable rolling stock was damaged in the flood and will require repairing before it can be used. While many manufacturing plants throughout the state were inundated and their machinery was damaged, it is not believed that much machinery was totally ruined. The flood will result in a very heavy demand on structural shops for railroad and highway bridges.

The foundry plant of the Railway Materials Company, Ironville, Ohio, was burned March 29, with a loss of \$4000.

The Bryan Show Case Company, Bryan, Ohio, has commenced the erection of a new plant. The main building will be of brick construction, 50 x 175 ft. with a 100 ft. L extending from the rear. Individual motors will be installed for driving machinery.

The Cleveland Stone Company, Cleveland, Ohio, will rebuild its plant at Amherst, Ohio, which was burned a few weeks ago.

Reports from Columbiana, Ohio, state that a new rubber plant for that village is assured. A number of Carrollton, Ohio, men are promoting a company with a capital stock of \$100,000. A plant 150 x 250 ft. will be erected.

The Ohio Electric Automobile Company, Toledo, Ohio, will shortly begin the erection of additions that will double the capacity of its plant. Plans provide for two additional buildings, one 60 x 240 ft., three stories, and the other a two-story structure, 60 x 100 ft.

The Firestone Tire & Rubber Company, Akron, Ohio, will build an extension to its power plant. Engines, boilers and other equipment will be required.

The American Steel Grave Vault Company, Galion, Ohio, has purchased property adjoining its site on which it will erect a factory addition 60 x 130 ft. The contract for the building has been placed.

The Trumbull Steel Company, Warren, Ohio, expects to have its plant ready for operation July 1. Work on the plant has been delayed somewhat in the part two weeks by the flood.

The Cope Hardware & Supply Company, Wellsville, Ohio, has been incorporated with a capital stock of \$20,000 by Samuel S. Cope and others to manufacture and deal in hardware, glass and metal goods.

The Bayview Foundry Company, Sandusky, Ohio, has increased its capital stock from \$75,000 to \$200,000.

The Buckeye Rubber Company, Akron, Ohio, will remodel its plant and add a second story 40 x 140 ft.

The Joseph W. Grosswiller Company, Toledo, Ohio, has been incorporated with a capital stock of \$100,000 to manufacture and deal in plumbers' supplies, steam fitters, manufacturers, railroads, mine, mill and oil well supplies. The incorporators are Frank W. Caughling, Harry W. Isenberg, Frederick G. Zink, Charles Weirich and Newton A. Tracy.

The Newark Stamping Company, Newark, Ohio, has been incorporated with a capital stock of \$50,000 by Eugene F. Ball, Charles F. Sites, Jacob R. Davies, M. J. Reese and Walter C. Metz.

Detroit

DETROIT, MICH., April 8, 1913.

No large transactions in the machinery market have occurred in the past week, and a tendency toward dullness is noted. There is a fair demand for single tools from the automobile trade and some scattered business from other sources, but no sales or inquiries of any considerable interest. Second-hand machinery and tools are moving slowly. The redeeming feature of the situation as viewed by many is the increased activity in the local shops and factories, the employment of additional hands and the consequent prospective demand for new tools. The trade on the whole is not inclined to consider conditions as unsatisfactory and anticipates a better volume of business in the near future. The foundry trade is busy.

The Crane Company, Chicago, manufacturer of plumbing and steamfitting supplies, has begun construction of a branch in Detroit, for the handling of its Michigan trade. The main building, 100 x 100 ft., with five stories and basement, will be devoted to offices, salesrooms and stock rooms. The shops, which will be 60 x 100 ft., will be equipped with machinery for the handling of pipe and general supply work. There will also be a warehouse 100 x 175 ft., with trackage and dockage facilities.

The Burroughs Adding Machine Company, Detroit, has broken ground for an addition to its plant at Second and Amsterdam avenues, to cost approximately \$125,000. The addition will take the form of an extension to the present factory and will be 60 x 330 ft., of brick construction, four stories and basement. It has not been definitely decided what departments will occupy the addition.

The Kelsey Wheel Company, Detroit, manufacturer of automobile wheels, has acquired a site of four acres in Windsor, across the river from this city, and will erect a large branch plant.

The Detroit Steel Products Company, Detroit, has also taken steps for the establishment of a branch plant in Windsor, and has acquired a five acre site for its factory. The general plan of the plant will be along the lines of the Detroit factory, and it will be equipped for the manufacture of automobile springs, steel windows, etc.

The Gilmore Motor Mfg. Company, Detroit, has been incorporated with \$35,000 capital stock by George Gilmore, M. A. Shaw and others. The new company will engage in the manufacture of gasoline motors.

The Crescent Company, Detroit, has been incorporated with a capital stock of \$200,000 and will engage in the manufacture of automobile starting devices. The principal stockholders are H. H. Potter and F. W. Owen.

The tie and shingle mill of the White Marble and Lime Company, Manistique, Mich., was destroyed by fire April 2, entailing a loss of \$20,000. The mill will be rebuilt at once.

The Nichols & Shepard Company, Battle Creek, Mich., manufacturer of threshing machines, has filed notice of an increase of capital stock from \$550,000 to \$2,000,000. The increased capital will be used to extend the company's operations along present lines.

The taxpayers of Flint, Mich., have voted to bond the city for \$93,000 for the construction of a new sewage system.

The Marcellus Supply Company, Marcellus, Mich., has been incorporated with \$25,000 capital stock to manufacture leather specialties. The incorporators are L. M. Eddy, Walter Becker and Scott Vannetta.

The Michigan Hearse & Automobile Company, Grand Rapids, Mich., has been incorporated with \$600,000 capital stock to take over the business of the Grand Rapids Motor Truck Company and the Michigan

Hearse & Carriage Company. Both plants will be kept in operation.

Extensive improvements will be made to the furnace plant of the Mitchell-Diggins Iron Company, Cadillac, Mich. The stack will be rebuilt on a larger scale and changes will be made to allow the manufacture of a wider range of products.

The Greenwood Lumber Company, Ontonagon, Mich., is planning extensive improvements to its mill, including the installation of a battery of four new boilers, a new band saw and other machinery.

The Holland Automobile & Specialty Company, Holland, has been organized by R. A. Vos and others and will equip a large garage and repair shop.

The Escanaba Lumber Company, Escanaba, Mich., is preparing plans for the construction of a new saw mill to replace the one recently burned. The mechanical equipment will include two band saws, a resaw and other machinery.

Milwaukee

MILWAUKEE, Wis., April 7, 1913.

There has been no let-up in the fine run of orders booked by the shops in the Milwaukee district. They report from week to week that they are running further behind in deliveries and are trying to catch up by increasing production in every way possible. The March report of the Industrial Commission of Wisconsin says that the metal trades have greatly increased payrolls, with many workmen changing from shop to shop to better their conditions. Skilled men in machine shops are hard to get and employers are increasing the number of apprentices. An unusual condition has grown out of the rush condition, in that outside employers who are waiting for Milwaukee shops to execute their orders have sent some of their expert workmen to Milwaukee to help out and thus insure deliveries without too much delay. Milwaukee escaped any considerable damage by reason of atmospheric and climatic conditions, although heavy rains caused some inconvenience to shops in the lowlands. It is fortunate that the city is so situated that only extreme conditions can bring about disasters such as have recently visited other districts. A little thing like a flooded ground floor is taken good-naturedly in view of the roof-high floods elsewhere.

The C. Colnik Mfg. Company, Milwaukee, which has been operating architectural and ornamental and steel works for many years, has been incorporated, with the same name and a capital stock of \$50,000. Cyril Colnik is president and A. L. Gauckler secretary and treasurer. No changes in works are in immediate prospect. The plant is located at 732-766 Greenbush street.

F. H. Runkel, W. H. Roehm and D. T. Lurvey of Portage, Wis., have organized the Silica Products Company, with a capital stock of \$75,000, to develop extensive silica deposits in the vicinity of Portage.

The Rundle Mfg. Company, Twenty-seventh and Wahl avenues, Milwaukee, has been reorganized with a capital stock of \$100,000, following the retirement of Capt. Joseph P. Rundle, founder and president, whose interest is purchased by his son, Frank E. Rundle, Robert T. Haselwood and Henry Held. The company manufactures brass fittings, enameled ware and other goods, materials and supplies for the plumbing, steam, gas and hot water fitting trades. Mr. Haselwood has been elected president; Frank E. Rundle, vice-president, and Henry Held, secretary and treasurer. Mr. Held continues as manager of works.

The Electrical Fire Alarm Company, Two Rivers, Wis., recently organized with a capital stock of \$25,000, intends to proceed at once with the erection of a workshop to cost about \$7,500. Alarm devices will be manufactured. None of the equipment has been purchased as yet.

The Mishicott Light & Power Company, Mishicott, Manitowoc County, Wis., has been organized with a capital stock of \$25,000 to produce and sell electric current for lighting and power purposes. Ira Beyer of Mishicott is behind the venture.

The Joseph M. Boyd Company, Madison, Wis., representing a principal interest in the Bank of Wisconsin, Madison, is making preliminary arrangements for the construction of an eight-story steel store and office building, 100 x 175 ft., at Monona avenue and West Main street. Joseph M. Boyd is general manager.

The Marinette Iron Works, Marinette, Wis., which occupies the entire foundry section of the old Prescott Company, is working at capacity, having recently booked large contracts for brick-making machinery. The repair department, boiler and machine works are

running at top speed to cope with the demands of manufacturers in the twin cities of Marinette, Wis., and Menominee, Mich.

The Wisconsin Electric Company, Racine, Wis., whose incorporation was recently mentioned, has secured quarters and is now ready for equipment. It has purchased some machinery for the tool room, but will soon be in the market for turret lathes, ranging from $\frac{3}{8}$ in. to 1 in., pumps, presses, automatic screw machines, disk grinders, polishing heads and a general line of machinery for light manufacture.

The Koban Mfg. Company, Milwaukee, has been incorporated with a capital stock of \$25,000 by L. F. Nohl, E. Nohl and E. L. Wallace. The new organization will manufacture machinery.

The American Welding & Mfg. Company, Milwaukee, has been organized with a capital stock of \$10,000 and has equipped a plant with welding and cutting machinery at Clinton and Park streets. The officers of the new company are: F. A. Uttecht, president; S. H. Smith, vice-president, and A. F. F. Uttecht, secretary and treasurer.

The Aerial Cutler & Mfg. Company, recently removed from Duluth to Marinette, Wis., has incorporated with a capital stock of \$35,000. The incorporators are C. F. Jaeger, H. F. Jaeger and J. D. Phillips.

The Chippewa Falls Commercial Club, Chippewa Falls, Wis., has under way a project for financing and reopening for operation the foundry and woodworking shop of the former Stanley Mfg. Company of that city, which has been idle for several years.

At the annual meeting of the Mauston Aluminum Company, Mauston, Wis., M. L. Bunnell was elected president; W. B. Curran, vice-president; Walter Marvin, secretary, and B. F. Broezel, treasurer. Reports on the past year's business indicate that additions will be made necessary within a short time.

S. W. Brew, village clerk, West Milwaukee, Wis., closes bids on April 15 for the construction and equipment of a complete sewage purification and disposal plant. G. C. Geigner, 20 Mack block, Milwaukee, is consulting engineer.

The Common Council of Jefferson, Wis., is considering the purchase of machinery and equipment whereby the present municipal electric light and power plant will be augmented to serve as a municipal central heating plant.

The Four-Wheel Drive Auto Company, Clintonville, Wis., whose plans for a new plant were recently mentioned, is now in the market for a 150-hp. Corliss steam engine with direct connections, 175-hp. boiler, turret lathes, milling machines, grinding machines, engine lathes, etc.

The American Skein & Foundry Company, Racine, Wis., has begun work upon the erection of a 120-ft. addition to its present foundry.

The Burdick Cabinet Company, Milton, Wis., has purchased a manufacturing site upon which factory will be erected, building operations to begin at once.

Wheeling

WHEELING, W. VA., April 8, 1913.

A new generator and other electrical equipment will be needed at the Parkersburg Iron & Steel Company's plant, which was damaged by the flood. A force of 60 men has been placed at work on the plant, which must be rehabilitated. The work will require several weeks. President C. F. Nieman has gone East to buy machinery.

Plans are under way to rebuild the plant of the Webster Woolen Mills Company, Webster, W. Va., which was recently destroyed by fire. It is planned to triple the original capital stock and build a modern plant costing \$75,000.

The Fairmont Brick Company, which was organized last month with a capital stock of \$50,000, has started construction of a modern plant near Fairmont, W. Va. Machinery for the plant has already been ordered and will be shipped within 30 days. The company has 28 acres with two veins of shale.

The Hampshire Garage, Romney, W. Va., has been incorporated with a capital stock of \$5,000 to buy, sell and repair automobiles. The incorporators are John J. Cornwell, Thomas F. Martin, W. W. McCline, E. V. Parker, D. E. Pugh, all of Romney.

An involuntary petition in bankruptcy was filed in the United States Court at Wheeling against the Davis Price Foundry & Machine Company, of New Cumberland, W. Va. The liabilities are given as \$30,270.58 and the assets \$44,214.06.

The Forest Lumber Company, Fairmont, with chief works in Pocahontas County, has been incorporated

with \$500,000 authorized capital stock. The incorporators are John Y. White, R. M. Hite, Lloyd Bailey, Alex. R. Watson and R. L. Long, all of Fairmont.

William E. Jones, president of the Ohio Tool Works, Columbus, Ohio, has been in Charleston, W. Va., preparing for the location of its plant in that city. Work on the erection of the plant will begin in July. The Columbus, Ohio, and Auburn, N. Y., plants will be combined there.

Cincinnati

CINCINNATI, OHIO, April 8, 1913.

Communication with the outside world was only opened the latter part of last week, and quite a number of machine-tool builders report some excellent orders received. Canadian business has been especially good lately, but European orders are rather slow. It is estimated that before the week is over every manufacturing plant in this territory that was shut down on account of the floods will be able to resume. This does not apply to a few local foundries, nor to all plants located above where the damage was greater.

On account of the large number of bridges destroyed the demand for structural shapes will undoubtedly be very heavy in this section of the country.

The Sohn & Rentschler Company, Hamilton, Ohio, will require considerable equipment for a new foundry to be erected in place of its plant that was destroyed by the floods.

The Hamilton Foundry & Machine Company, Hamilton, Ohio, has let contract for a new building that will be 60 x 455 ft., one story and of brick construction. Considerable extra equipment will be needed, but the list has not yet been made up.

It is stated that the Champion Coated Paper Company, Hamilton, Ohio, whose large plant was destroyed by fire last week, will be rebuilt on the same site. Details as to the machinery that will be required are not yet available.

The Stedman Foundry & Machine Company, Aurora, Ind., manufacturer of coal crushing and agricultural machinery, has been purchased by a new firm composed of the following members: Chester A. Peebles, George H. Marting, Perin Langdon, Jr., and S. B. Sutphin, all of Cincinnati. Some additions to the plant may be made in the near future.

The Patented Specialties Mfg. Company, Cincinnati, manufacturer of fireproof factory windows, has increased its capital stock from \$10,000 to \$25,000. No factory additions are planned for the near future.

The Eagle White Lead Company, Cincinnati, has planned another addition to its plant on Reading road. Very little machinery equipment will be required.

The Gilderman Foundry & Mfg. Company, Syracuse, Ind., has been incorporated with \$18,500 capital stock and has purchased the plant of the Syracuse Boiler & Radiator Company. George Gilderman, La Porte, Ind., is one of the principal incorporators.

The Cincinnati office of the General Electric Company will soon be moved to the Provident Bank Building on Vine street.

The Duncan Electric Mfg. Company, Lafayette, Ind., has had plans prepared for a large addition to its plant. No details are available as to the company's requirements.

It is rumored that the Cincinnati Time Recorder Company is contemplating making an addition to its plant on Central avenue. In case this is definitely decided on, considerable special equipment will be required.

The five-story furniture factory of the E. M. Hulse Company, Columbus, Ohio, was badly damaged by fire April 3. Rebuilding operations will be commenced at once.

The Central South

LOUISVILLE, KY., April 8, 1913.

Flood conditions remain the chief feature of the situation in this territory. Though the Ohio River is now falling fairly rapidly, a great deal of water remains to be let out before the stream regains its normal channel. Meanwhile postal service, while still slow, is greatly improved, but freight service remains practically *hors du combat*. Machinery-distributing houses have been unable to get shipments from the factories, and report that the carriers in the Middle West are unable to take freight, a terrific congestion

of traffic being a prospect of the immediate future. Consumers who have equipment already bought are clamoring for it; but others are doing little, apparently having decided not to make additional expenditures until the business situation is righted. One of the machinery lines favorably affected by the flood is selling trench pumps, with direct-connected engines. A contractors' supply house which had a big stock of pumps on hand as a result of the flood last January reported that its entire supply was exhausted by orders telegraphed in from dealers all over this section. Incidentally the damage wrought by floods in the trade district usually covered by Louisville machinery concerns is suggested by the fact that one branch house located here has 1300 miles of navigable waterways in its territory.

The James Clark, Jr., Electric Company, Louisville, has received an order from the Seelbach Hotel Company, Louisville, for motors to operate pumps and other machinery in its new power plant. They include a 35-hp., three 15-hp., one 10-hp., two 5-hp., and two 20-hp. units. It has also received an order from the Norton & Curd Coffee Company, Louisville, for a 3-hp. and a 25-hp. motor for the operation of its special machinery.

The American Machine Company, Louisville, is finding the demand for passenger elevators particularly good, hotels having supplied a considerable amount of business of late. Four have been sold for the American Hotel Annex, St. Louis; three to the Ansley at Atlanta, and several to the Washington Hotel at Indianapolis.

The Kentucky Rim & Shaft Company, First street and Central avenue, Louisville, suffered \$7,500 damage by fire last week. It is probable that the boilers will have to be replaced and some additional special machinery purchased. H. F. Donigan is president of the company.

Hines & Ritchey, Louisville coppersmiths, who manufacture distilling outfits largely, are contemplating securing larger quarters and will probably provide for an increased output of copper products.

The Benzole Garment Cleaning Company, Louisville, will purchase a new boiler in the near future. C. P. Harding is president of the concern.

H. M. Bylesby & Co., of Chicago, have closed a deal whereby all of the local utilities in the electric and gas fields are to be merged under its management, the necessary ordinances having been passed by the city council. A pipe line will be built to West Virginia to supply natural gas, this having been one of the conditions of the merger. Several power houses will be erected between here and the gas fields for the purpose of keeping the fluid under pressure. Contracts for machinery needed in this connection will be let from the company's Chicago offices. It is stated that the pipe line will cost \$3,000,000 and the power plants \$880,000.

The Louisville Commercial Club is making progress in its efforts to form a \$500,000 company for the purpose of bringing new factories to the city. A meeting was held April 3 for the purpose of discussing the matter, a number of iron men attending. J. M. Johnson, of the Louisville Bridge & Iron Company, spoke for the Board of Trade at the meeting.

The Fayette National Bank, Lexington, Ky., will install ice machines in its new 15-story office building. A large vacuum cleaning system will also be put in.

T. G. Stuart, Winchester, Ky., who recently purchased a water franchise at Jackson, Ky., is planning to begin construction work in the immediate future, it is reported.

The State of Kentucky is considering the installation of waterworks, ice machinery and electric lighting equipment at the penitentiary at Frankfort, Ky. A. J. G. Wells is warden. The institution is under the control of the State Board of Prison Commissioners.

The Marshall-Featherstone Motor Car Company, Lexington, Ky., has opened a new garage, and will proceed with the construction of its machine shop, which is to be 50 x 50 ft.

The Frick Sawmill & Engine Company has established a distributing branch at Hazard, Ky. A special building is now being constructed for the storage of machinery to be carried in stock.

J. D. Tipple, Youngstown, O., formerly proprietor of the Youngstown Pattern Works of that city, has announced plans for the establishment of a wood pattern plant at Nashville, Tenn., under the name of the Nashville Pattern Works. The plant is to be established at Seventeenth street and Centennial Boulevard, and will employ from 25 to 30 men.

The Sandersville Ice Company, Sandersville, Ga.

has been reorganized and will begin operations. George W. Hanson, Sanford, Me., is president.

Birmingham

BIRMINGHAM, ALA., April 7, 1913.

"Machinery in considerable variety and machine tools are being sold in satisfactory volume and there is every prospect of a continuance of these conditions in the trade in this part of the South for some time to come." This remark was made by the sales agent of the largest wholesale hardware and machinery firm in this section. He added, "The demand for engines, boilers and gasoline engines is very good. Gasoline engines are becoming more and more popular in Alabama, going to farms, mines and factories. The sawmill trade is steady. Business is not up to the volume of January, but there is no room for complaint in any direction so long as the sawmills remain active, the mines busy and the contracting business on such a large scale."

The Smalley Motor Car Company, Lincoln, Neb., contemplates building an automobile factory at Kismet, Fla.

The Seminole Rubber Company will establish factory for manufacture of automobile tires at Jacksonville, Fla. An old tannery building will be remodeled and machinery installed. J. J. Weyer and others.

The city of Birmingham will build another crematory at a cost of \$10,000.

W. K. Sloan, Swedesboro, N. J., is applying for a franchise for a gas plant at Cordele, Ga. Frederick Harder is mayor.

The Forbes Pioneer Boat Lines Company, Miami, Fla., contemplates installing electric lighting plant upon Ritta Island, Lake Okeechobee.

Andrews, N. C., parties propose to furnish the city of Young Harris, Ga., with electric lighting plant from a dam on Hiwassee River.

The city of Whigham, Ga., will vote on April 18 on an issue of \$6,000 of bonds for an electric lighting plant.

The Universal Ice Company, Birmingham, Ala., proposes to build an ice factory at La Fayette, Ala., if citizens subscribe 60 per cent. of the stock. This company has submitted a number of such proposals to Alabama towns and several plants have been determined upon.

The Youngs Mining Company, Youngs, Ga., has been incorporated for the purpose of mining brown ore. W. S. Hightower and A. Y. Henderson will operate the plant.

The Clements Naval Stores Company, Greenville, Fla., has been incorporated with a capital stock of \$10,000 by George T. Betts, C. W. Evans and others.

The Vidalia Naval Stores Company, Vidalia, Ga., has been incorporated with a capital stock of \$15,000 by A. Peacock, Barnesville, Ga.; J. B. Webb, Vidalia, and others.

The Eagle & Phenix Mills, Columbus, Ga., is reported as preparing to erect a steam power plant to take the place of its hydro-electric plant in emergency.

The Atlantic Compress Company, Columbus, Ga., has begun rebuilding of its compress burned some time ago. It will have cement floors and metal roof.

J. M. Dunwoody of Atlanta, architect, is preparing plans for improvement of the ice plant of the Atlantic Ice & Coal Company, Atlanta, Ga., in Cordele, Ga. It will expend \$15,000.

The city of Attalla, Ala., will vote April 28 on a proposition to take over the water works plant of the Etowah Light & Power Company.

The J. B. McCrary Company, Atlanta, has contracts to build water works systems at Conyers, Ga., and a water works and municipal electric lighting plant at Gainesville, Fla.

Texas

AUSTIN, TEXAS, April 5, 1913.

Machinery and tool trade conditions in Texas remain about as they were a few weeks ago. Dealers are well satisfied with the situation, particularly in the country districts. In Arizona and New Mexico the mining industry is showing an increased activity and much new machinery and equipment will be installed in the near future at the different properties. Conditions in Mexico have apparently gone from bad to worse. Instead of the new government being able to restore peace as was confidently believed by many people, it is facing a situation that is regarded as extremely critical. From nearly every part of that country come reports of rebel activities and the con-

stituted government is apparently unable to cope with the widespread revolt. Many mines and several of the large smelters have again closed down, and the hopes which were entertained a few weeks ago that there would be an early resumption of the demand for American machinery of various kinds in that country have been dissipated.

The Farmers Gin Company will build a cotton gin at Jonah. The incorporators are C. C. Wickstrom, C. C. Holmstrom, Gus Johnson and others.

The Missouri, Kansas & Texas Railway Company will construct extensive terminals, warehouses and wharves at Freeport it is announced.

The Farmers Union Gin Company will build a four-stand cotton gin at Brownwood.

At the recent election of tax-payers the proposition of issuing \$75,000 of bonds for the construction of a sanitary sewer system at Temple, Texas, was carried.

The Chico Crushed Stone Company is installing a large amount of machinery and other equipment at its stone quarries near Chico. It will soon be prepared to crush and ship 40 to 50 cars of crushed stone a day.

The Waxahachie Gas Company will soon begin the work of erecting its gas manufacturing plant at Waxahachie and laying a system of distributing mains.

The Farmers Gin Company will erect a new cotton gin at Blanket.

The Bowie Ice & Cold Storage Company will erect an ice factory and cold-storage plant at Bowie. Those interested are T. C. Phillip, Joseph N. Brown and C. B. Morgan.

Plans are being made for the erection of a municipal waterworks plant and the construction of a distributing system at Rosebud. A pumping station will be built on the Brazos River where the water supply will be obtained.

The Texas Light & Power Company is erecting a new electric light and power plant at Paris. It is making other important improvements to the system.

The Lamar Cotton Oil Company is building an addition to its cotton seed oil mill at Paris.

T. A. Johnson of Paris and associates will build a new cotton compress at that place. A large warehouse will be erected in connection with the plant.

The Brenham Electric Light Company is making extensive additions and improvements to its plant and service at Brenham.

The San Antonio, Uvalde & Gulf Railroad will erect its general shops at Pleasanton. A large amount of machinery will be installed.

The Northern Texas Brick Company will build a manufacturing plant at Bryan. Tests are now being made of the clay beds which are to furnish the material for making the bricks.

C. B. Lutenbacher will build a cement brick plant at Yorktown. It will have a capacity of about 10,000 bricks per day.

The Berclair Gin Company will install new machinery in its cotton gin at Berclair.

The Winter Garden Ranch Company, which was recently organized for the purpose of constructing a large system of irrigation near Crystal City, will build a reinforced concrete dam across Espendosa Lake and another dam across the Nueces River for the purpose of creating water-storage reservoirs from which the water supply to irrigate the land will be obtained. The dams will cost about \$200,000. Alexander Boynton of San Antonio is superintendent of the company.

The Texas Light & Power Company has purchased the light and power plant of the Ennis Light & Power Company at Ennis, and it is announced that it will enlarge and improve it.

The Electric Railway Company of El Paso, which is a subsidiary of Stone & Webster will construct a system of transmission lines at points in the valley of the Rio Grande for the purpose of supplying farmers and others with electric power for operating electric pumping plants and other industries.

The City Commission of San Antonio has under consideration the building of a number of extensions of the San Antonio sewer system.

J. A. Bachman is constructing a large system of irrigation near San Marcos. It will be equipped with a complete pumping plant.

The Deming Ice & Electric Company will install in its electric power plant at Deming, N. M., high-pressure boilers and stokers, new substation transformers, direct-connected Chuse Corliss engine, 225 hp.; new switchboard panels, motor-driven pumps, condenser pumps, and all the incidental equipment necessary for the installation of an up-to-date power plant. The cost of this machinery is about \$80,000. It is also build-

ing an extensive system of power transmission lines to farms in the Mimbres valley where many irrigation pumping plants are being installed.

Arnett & Elledge are building a gray iron foundry at Gainesville, the building to be 30 x 40 ft., with a melting capacity of 5 tons per day.

St. Louis

St. Louis, Mo., April 7, 1913.

The machine tool market at this point continues quiet, but the number of inquiries seems to be increasing with indications of enlarged business. The lists are small, indeed the inquiries are largely for single tools, but the aggregate is not at all discouraging to the dealers who report themselves confident of better business from now on.

The St. Louis Board of Public Improvements will receive bids until April 18 for the construction and equipment of a new intake tower for the water works, including filtration equipment.

The grain elevator of the Rosedale Coal & Feed Company, St. Louis, was burned last week with a loss of about \$20,000. The elevator will be replaced, it is stated.

The Southwest Missouri Quarries Company, St. Louis, with \$30,000 capital stock, has been incorporated by Edwin L. Merrill, Albert W. Merrill, S. J. Jones, George A. Bruce and George W. Millar to equip and operate limestone quarries of considerable extent in the vicinity of White Sands, Ste. Genevieve County, Mo.

The Marshfield Electric Company, Marshfield, Mo., has been incorporated with \$10,000 capital stock by John E. Hosmer, Jefferson B. James and J. E. Haynes and will equip an electric plant.

The Safety Burner Company, Cabool, Mo., with \$50,000 capital stock, has been incorporated by L. M. Edens, Charles P. Palton, Edgar S. Parmenter, Paul S. Grant and Charles S. Frederick to manufacture a patented device.

The Young Portable Device & Mfg. Company, Brookfield, Mo., with \$50,000 capital stock, has been incorporated by Frank R. Young, Ernest R. Lucas and H. W. Roloff to equip a plant for the manufacture of patented devices.

The Mount City Bottling Company, St. Louis, with \$10,000 capital stock, has been incorporated by Fred W. Meyer, Julius Hettzle and E. F. Osborn and will equip a bottling plant at once.

The Liquid Tire Company, Kansas City, Mo., with \$125,000 capital stock, has been incorporated by Charles S. Wright, George L. Schofield and Clay W. Prewett to equip for the manufacture of a patented compound for filling automobile tires.

The Western Cabinet & Fixture Company, Kansas City, Mo., has increased its capital stock from \$20,000 to \$150,000 for the purpose of increasing its manufacturing equipment and other facilities.

The Berryville (Ark.), Canning Company, whose incorporation was recently reported, is proceeding to build and will equip with canning machinery as soon as construction proceeds far enough. J. E. Reynolds is president of the company.

The St. Tammany Canning Company is being organized at Covington, La., and is already in the market for machinery. The organization is in the hands of W. L. Stevenson.

The Newton Canning Factory, Newton, Miss., with \$50,000 capital stock, has been incorporated by W. H. Chambliss, W. E. Sansing and J. R. Rowzee and is purchasing the necessary machinery.

The Shelby Cooperage Company, Portland, Ark., will establish a plant at Helena, Ark., for the manufacture of tight barrel stoves.

The Oklahoma Stave & Heading Company, Olney, Okla., has been incorporated by B. F. Harrison, G. L. Kennedy, E. D. Miller and others and will equip a plant for cooperage manufacture.

The Tensas Cotton Oil & Mfg. Company, St. Joseph, La., whose plant was recently burned with a loss of \$50,000, will probably replace the plant, according to President E. Steinhart, of New Orleans.

The Jefferson Plaquemines Drainage District, of which George A. Hero, of New Orleans, La., is president, has plans for pumping equipment in connection with the drainage capable of lifting 900,000,000 gal. per day of 24 hours.

An electric light and water works plant to cost about \$20,000 is to be built at Sulphur Springs, Ark., by R. M. Galbraith, of Pine Bluff, Ark. A. C. Moore, of Joplin, Mo., is engineer.

An electric light and water works plant to cost about \$15,000 is to be constructed at Arlington, Tenn.,

under the direction of R. C. Huston & Co., of Memphis, Tenn., engineers.

The Stigler Electric Light & Power Company, Stigler, Okla., with \$15,000 capital stock, has been incorporated by J. N. and F. M. Ward and C. C. Ward, all of Fort Smith, Ark.

The Marsh Milling & Grain Company, Madill, Okla., has plans for the construction and equipment of a flour mill of 100 barrels per day capacity.

The Bright Oil Company, Lake Charles, La., with \$25,000 capital stock, has been incorporated by C. P. Martin and Harold Rock, of Lake Charles; J. G. Sutton and H. Avery, of Vinton, La., and W. M. Lucas, of Edgerley, La., to equip and operate oil lands controlled by them.

The Anticline Oil & Gas Company, Tulsa, Okla., with \$150,000 capital stock, has been incorporated by Robert N. C. Taylor, George W. Taylor and Charles W. Gimes and will develop oil property owned by them at once.

The timber from 25,000 acres in Jeffersonville and Lonoke counties, Arkansas, will be cut and manufactured in mills to be erected by the purchaser, R. Canahan, of the Inter-Southern Building, Louisville, Ky.

The Columbia Land & Timber Company, Stephens, Ark., recently incorporated by John F. Haltom, John G. Wepfer, R. S. Warnock and others will establish mills to work up timber on 11,000 acres of land in Louisiana in the vicinity of Farmerville.

The Alexander Lumber Company, Randlett, Okla., has been incorporated with \$15,000 capital stock by J. M. and R. Y. Alexander and others to establish a mill there.

The Forest Lumber Company, Oakdale, La., of which J. G. White, of Kansas City, Mo., is president, will build a double band sawmill at Oakdale to work up timber on 26,000 acres of land recently bought there.

The Waddell-Jones Lumber Company, Morgan City, La., will equip a saw and shingle mill at Lockport, La., to cost about \$20,000.

The Gus V. Brecht Butchers' Supply Company, St. Louis, will equip a plant with machinery to cost about \$6,000 for the manufacture of tin pails, etc.

The Blackwell Wire Fence Company, Blackwell, Okla., with \$50,000 capital stock, has been incorporated by David Oliver, of Blackwell; Andrew Hudson, of Chanute, Kan., and J. T. Pittsburg, Okla., and will equip a manufacturing plant at once.

The Deep Red River Mining Company, Manitou, Okla., recently incorporated with \$120,000 capital stock, will develop about 720 acres of mining property and is in the market for machinery.

The Lake Charles Grain Company, Lake Charles, La., with \$50,000 capital stock, has been incorporated by Rudolph C. Miller, Jackson K. Josey and others and will build a grain elevator at once.

G. T. Propper, of the Waterways Navigation Company, St. Paul, Minn., is planning the equipment of a grain elevator at New Orleans to handle grain to be transported from St. Paul by his company.

The Elliot Electric Company will build a plant at Shreveport, La., for the manufacture of electric fixtures.

The Omaha Engine & Tractor Company, whose plant at Ralston, on the outskirts of Omaha, Neb., was damaged by the recent tornado, reports that repairs are being made rapidly and operations will be resumed promptly.

C. R. Baum, Kansas City, Mo., will locate a factory for the manufacture of steel specialties at 1908 Wyandotte street, in that city, having transferred its business from Minneapolis.

William Priesmeyer, St. Louis, Mo., is contemplating the building of a machine shop and a site is already procured at 3033 Adams street.

The Pacific Coast

SAN FRANCISCO, CAL., April 1, 1913.

The machinery market, after a slight lull, is again improving, with some good-sized orders and a great deal of small business in immediate prospect. The Southern Pacific Railroad has just placed an order for a 42-in. Pond carwheel lathe, a 51-in. Niles vertical mill, and a 400-ton hydraulic wheel press, but other inquiries from the same source have been held up.

The principal feature at present is garage business. Several firms in the local automobile district are getting into fine new buildings, and are preparing to put in unusually well equipped shops, one of the inquiries including a milling machine, as well as lathes, shapers, etc. Many country garages are also being fitted up in prep-

aration for the summer rush, and the entire volume of inquiry from such sources is large. Shops in the oil fields are also taking a little more interest, but otherwise country business is not especially active. A machine shop for the Geary street municipal railroad is contemplated, and while there is no certainty of orders being placed a tentative list has been made out, including a 36 or 42-in. lathe, a 16 or 26-in. lathe, a carwheel lathe, a wheel press, a 3-ft. radial drill, a 20-in. drill press, a 24-in. shaper, grinders, hack saws, etc., all to be motor driven.

The demand for mining and logging equipment is gaining, and machinery for general construction is still one of the leading features, with a steady run of inquiries from many projects now under way. The installation of electrical generating machinery is proceeding rapidly, and the extension of distributing lines is accompanied by a steady call for motors. Marine steam and gas engines are also in fair demand.

It is announced that the Jeffrey Shop of the Western Pacific Railroad, near Sacramento, Cal., will be formally opened April 15.

Two new steamers have just been completed for the coastwise lumber trade, and nine are under construction. Most of the hulls are of wood and built in the north, but practically all are equipped with engines in San Francisco. One is being built by the Union Iron Works, this city, and the United Engineering Works, Oakland, has contracts for a number of the engines.

C. C. Moore & Co., engineers, and the local office of the Babcock & Wilcox Company, have moved from First and Mission streets to 40 First street, pending the construction of the new Engineers' Building at the former location.

W. R. Bassick of the Yuba Construction Company is visiting eastern machinery markets, and it is believed that he will place orders for a number of tools before returning.

Improvements planned this year for the San Joaquin Light & Power Company include the doubling of the Bakersfield and Kern River plants, large additions to the Santa Maria plant, additional work on the No. 2 power house on the San Joaquin River and on the Tulare River power house, and surveys for the No. 4 power house. The J. G. White Company has charge of the engineering work.

San Joaquin County, Cal., is taking figures on a steam turbine and electric generator for the county hospital.

E. Ontiveros and Charles Sampson are starting a machine shop at Santa Maria, Cal.

The town of Fullerton, Cal., has just taken figures on an electrically driven waterworks pumping outfit.

The Rotary Tractor Company, San Bernardino, Cal., has been incorporated with a capital stock of \$200,000, by M. Nett, F. W. Nett, C. F. Linderoth, F. H. Nett and A. J. Forbes.

The Los Angeles Motor Truck Mfg. Company has purchased a tract of land near Wilmington, Cal., and is preparing plans for a factory.

The rebuilt plant of the California Paper & Board Mills, Antioch, Cal., will have twice its former capacity, and will be equipped with direct-current steam turbine generators, all machines being motor driven.

The Hume-Bennett Lumber Company is erecting a new mill at Sanger, Cal., putting in new machinery to the amount of about \$40,000.

T. L. Meyers, representing the American Clay Machinery Company, is supervising the installation of a lot of new machinery for the San Luis Brick Company, San Luis Obispo, Cal.

It is reported that C. C. Prescott, Cleveland, O., and R. O. Stanley, Detroit, Mich., are figuring on putting in a stone working plant at Salt Lake City, Utah.

E. Beardsley, manager of the Klamath Falls Iron Works, Klamath Falls, Ore., was recently in San Francisco to order new machinery.

The Honolulu Iron Works, Honolulu, T. H., is building two new sugar mills for shipment to the Philippines. One is for Jose Zalueta, Iloilo, Panay, having a capacity of 150 tons of cane daily. The other is for the Calampa Sugar Company, near Manila, of 1200 tons daily capacity.

The Los Angeles Stove Works, Los Angeles, has been incorporated with a capital stock of \$25,000 by J. N. Russell, J. F. Guilloz, Robert Mallery, M. A. Rulles and E. L. McCormack.

Columns and roof trusses are now being erected for the Machinery Hall at the Panama-Pacific Exposition. Power saws and other machines have been installed to facilitate the construction. Hoisting engines, etc., are driven by compressed air supplied by a power plant on the grounds.

Eastern Canada

TORONTO, ONT., April 5, 1913.

The announcement is made that the Canadian plants of the Kelsey Wheel Company and Detroit Steel Products Company will be established in Windsor, Ont., within a short time.

It is reported that the Dome Mines Ltd., Porcupine, Ont., will increase the equipment of its stamp mill plant from 40 to 100 stamps by the addition of 60 stamps this spring.

In the House of Commons on Monday, the Minister of Railways and Canals made a statement as to the affairs of the Intercolonial Railway, and said that there would be purchased for the road 45 consolidated freight engines, 9 switching engines, 1423 steel-frame box cars, 150 wooden box cars, 200 steel under-frame flat cars, 200 steel-frame stock cars, 100 Hart-Otis coal cars, 35 refrigerator cars, 1 snow plow, 1 tank car, 7 sleepers, 4 diners, 7 first-class coaches and 3 baggage cars; and in addition there are under construction in the Moncton shops 150 wooden box cars, 18 conductor vans, 3 colonists and 1 flanger.

The Wallaceburg Brass & Ironworks Company's factory, Wallaceburg, Ont., will be enlarged and a greater number of hands will be employed.

The Hydroelectric Department of the Hamilton, Ont., will establish a transforming station in Victoria Park.

Contracts, which call for an expenditure of \$10,000, have been let for the excavation of a basement under the cold-storage buildings of the Harris Abattoir Company at Sudbury, Ont., and the installation of a mechanical freezing plant to be run by electricity. The office departments are to be enlarged and remodeled.

Blenkharn & Sons' axe factory at Canning, N. S., was destroyed by fire at a loss of \$15,000.

Canadian Drednot Motor Trucks, Ltd., Montreal, has been incorporated with a capital stock of \$250,000 to carry on the business of manufacturers of and dealers in automobiles, cycles, motor trucks, engines, carriages and conveyances of all kinds, and in all articles used in the construction thereof.

The Vermont Marble Company, Proctor, Vt., will erect a Canadian branch at Peterborough, Ont. The plant will be located on property east of the Peterborough Lumber Company's mills. The company will receive a free site and exemption from a business tax for 10 years.

The Canadian Government has awarded to the Cammell-Laird Company, England, a contract for the construction of a powerful ice-breaking steel railroad ferry boat to operate between Quebec and Levis. The boat will be the most modern of its kind and will cost \$588,000.

The Rhodes Curry Company's wood-working plant at Halifax, N. S., was totally destroyed by fire, with a loss of \$50,000. The plant was fully insured.

The Dominion Cannery, Ltd., will erect a factory at Chatham, Ont.

The promoters of a company which is largely composed of employees of the Preston Car & Coach Company are applying for a charter under the firm name of the Grimsby Electrical Car Company. Thomas J. Bailey, formerly superintendent of the Preston Car & Coach Company, is the promoter. It is intended to erect a plant in the town of Grimsby, Ont., which place agrees to supply a free site, exemption from taxes for ten years, and free water for five years. Business men of Grimsby and Preston will be largely represented on the board of directors. It is expected that Mr. Bailey will be managing director.

Three members of the New Brunswick Legislature, H. W. Woods, Hon. George J. Clarke and George B. Jones, are directors of the New Brunswick Coal, Iron & Clay Company, of St. John, N. B., with \$298,000 capital stock, which has been organized to develop mines in Queens County on the west side of the St. John River.

The Canadian Lactal Company will start a factory at Lindsay, Ont., about April 15. The plant will mean much for the farmers of that vicinity and will consume 30,000 lb. of milk per day. It proposes to increase the capacity to three times that quantity.

Watt & Blackwell, the architects, awarded the contract for the McCormick plant in East London, Ont., to the Canadian Frost & Winchester Company, of Montreal, for about \$260,000.

S. L. Clark, manager of the Manchester Realty Company, announced that a small iron and tool industry will locate on the Manchester Survey of Galt, Ont., and building operations will commence within three months if not before.

The George Irish Paper Corporation, Buffalo, N. Y., Lewis F. Houpt, president, is preparing plans for a paper mill to be erected at Fort Frances or International Falls, Ont., for the manufacture of book and wrapping paper.

The Canadian Frost & Winchester Company, Windsor, Ont., has been awarded contract for the construction of the McCormick Harvester plant at London, Ont. The approximate cost will be \$260,000.

The London Electric Company, London, Ont., is preparing plans for extensions to its plant. Two turbines of 500 hp. each and other electrical machinery will be installed.

The Canadian Hanson & Van Winkle Company, Ltd., West Toronto, Ont., manufacturer of foundry supplies, etc., will build a four-story and basement addition, 50 x 255 ft., to its plant. Upon completion the company will add to its products electro-plating generators and other electrical appliances.

The Gurney Foundry Company, Toronto, will add to its plant a two-story cupola building of brick and steel and a one-story brick and steel core shop. Estimated cost \$45,000.

The Dominion Fireless Cooker Company, Toronto, has been incorporated with a \$40,000 capital stock by Harris E. Wallace, Lowell W. Wood and Eric R. Thomson are the provisional directors. The company will equip a plant for the manufacture of fireless cookers and aluminum ware.

Western Canada

WINNIPEG, MAN., April 5, 1913.

There is a better feeling this week in local industrial circles. The weather is more springlike, and different lines of construction work are starting up more actively than previously. The machinery men are confident that they will experience a heavy demand for supplies in the course of the next few weeks, as quite a number of new manufacturing plants are in contemplation in the larger cities of western Canada. There is considerable activity in this connection in the province of British Columbia. Several new sawmills will be erected there this year. Money stringency is still in evidence, but the outlook appears to be more hopeful.

The Unit Brick Company, Regina, Sask., is reported contemplating the establishment of a plant at Swift Current.

R. B. Johnson is building a shoe factory in New Westminster, B. C. It is expected that most of the machinery will be installed in the course of two or three weeks.

The McNabb Milling Company, Saskatoon, Sask., is preparing to erect a small flour mill at Humboldt, Sask. It will have a capacity of about 100 barrels per day.

The Churchard-MacKay Lumber Company, Port Moody, B. C., has been formed and a lumber mill will be erected.

The Hammond Stooker Company, Winnipeg, has signed a contract to establish a manufacturing plant at Redcliffe, Alberta, at a cost of about \$250,000. R. Hammond is the manager of the company.

If negotiations now under way materialize, the Canadian Explosives Company, Ltd., and its allied interests on Vancouver Island, will shortly establish new headquarters for the manufacturing of its products and invest \$1,000,000 in a new plant.

The City Commissioners of Calgary, Alberta, are planning for an asphalt paving plant, at a cost of about \$60,000. The clerk is J. M. Miller.

It is announced that the International Harvester Company will erect a factory at Fort William.

The Armour Company, Chicago, has purchased a site in Saskatoon, Sask., on which it is planned to erect a packing plant.

The Dickson Bridge Works, Edmonton, Alberta, contemplates establishing iron works at South Edmonton. The company will manufacture steel girders.

The Brunette Sawmills Company, Ltd., New Westminster, B. C., will expend about \$15,000 this season for new machinery and additions to the plant.

Captain Justice, of Salt Spring Island, B. C., has let a contract for a small sawmill. It will have a capacity of about 6000 ft. per day, and be driven by an oil engine.

The Quatsino Timber Company, Ltd., Quatsino, B. C., has been incorporated, with a capital stock of \$75,000. It contemplates the erection of a sawmill and planing mill this year.

George Smith, Vancouver, B. C., is the promoter of a company that will erect a sawmill this summer in the northern part of British Columbia.

J. F. Hewitson has closed a contract with the Canadian Pacific Railway to deliver 2,500,000 yards of crushed rock during the coming season. This contract will necessitate the installation at the Inter-Cities Quarries plant at Port Arthur, Ont., of much additional equipment.

The J. J. McLean Lime Company, Young, Sask., is doubling the capacity of its plant. The Grand Trunk Pacific is putting a spur line to the plant and loading facilities will be modern and complete.

The Alberta Machine Shop & Foundry, of Medicine Hat, Alberta, will, as soon as the addition to the building is made, install half as much more machinery as it now has in its shops, including planing machines, lathes, cutting machines, steam hammers, etc. The cost of the new machinery will be about \$10,000 and the cost of the addition to the building \$4,000.

It is announced that the Western Canada Milling Company has accepted the proposal of the Calgary city authorities and will build a large rolling mill there. The city made a tender to the milling concern, which, according to the figures of a power expert, will cost Calgary \$40,000 per year for the next 10 years.

A deal for the location at Humboldt, Sask., of one of the largest and best equipped flour mills in the west has been closed. It is to be undertaken by Hon. A. P. McNab, of Saskatoon, and the mill will have a capacity of 100 barrels per day.

Sir John Jackson, the English public works contractor, will be given the work of improving the harbors at Vancouver and Victoria and building a drydock 1000 ft. long. The new drydock will be one of the largest on the continent, being capable of accommodating a superdreadnought in any condition.

Government Purchases

WASHINGTON, D. C., April 7, 1913.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids May 3 for four electric traveling bridge cranes and two electric traveling wall cranes for the general foundry, navy yard, Puget Sound. The installation will require one 20-ton, 4 motor, with 5-ton auxiliary, two 5-ton, 1 motor, one 3½-ton 3 motor traveling bridge cranes, and two 5-ton, 3 motor traveling wall cranes with trolley wires and supports complete.

The office of the commanding officer, Rock Island Arsenal, Rock Island, Ill., will open bids April 14, under proposal 737, for furnishing one centrifugal pump, one 30-hp. motor and one oil circuit breaker, the pump to have a capacity of 800 gal. actual delivery, with 7-in. suction and 6-in. discharge.

The Department of the Interior, United States Reclamation Service, Washington, will open bids April 30 for furnishing five 70-ton electric power shovels for use on the Milk River and Sun River projects, Montana.

The Department of the Interior, United States Reclamation Service, Babb, Mont., will open bids April 28 for furnishing two 70-ton steam shovels.

The daily consular reports, issued by the Bureau of Manufactures, Department of Commerce, Washington, give a number of foreign trade opportunities for machinery and equipment. Detailed information may be obtained from the department. Abstracts of these inquiries are as follows:

No. 10,518—C. A. Parsons & Co., Newcastle-on-Tyne, Northumberland, England, will receive tenders for one 10-ton single-motor traveling lift to work on 110-volt continuous current.

No. 10,520—A report from an American consul in England states that a firm of button makers there desires to secure the names of American manufacturers of turning tools suitable for either bone or wood.

No. 10,532—An import agent in an European country desires to represent American manufacturers of tunneling and mining machinery, air compressors, etc.

No. 10,668—An American consul in an European country has had inquiries for prices and descriptive catalogues of motors from 10 to 50 hp., and for automobiles and machinery used in the production of automobiles.

No. 10,691—The American consul at Bombay, India, reports that there are indications of an active interest in improved methods of baling hay and similar products for transportation. The Department of Commercial Intelligence, India, is advertising for hay baling presses.

No. 10,692—An American consul in Canada has had requests for machinery for the manufacture of small wooden articles, such as brooms, buckets, shoe-trees, etc.

No. 10,693—A steamship company operating a fleet of steamers and ferryboats on the Bosphorus proposes to put into commission a number of large motor boats for ferry service. The engines should be from 25 to 30 hp., giving the boats a speed of about 13 knots per hour.

No. 10,697—Tenders will be received at the College des Bourgeois at Echevins, Hotel de Ville, Anvers, Belgium, until April 23 for five motor boats.

No. 10,704—An American consul has had a request for names and addresses of manufacturers of automatic machinery for the manufacture of glass bottles.

No. 10,705—A business firm in Mexico is planning to enlarge its machine shop and is in the market for one 20-in. spring lathe, one drill press and a boring mill.

